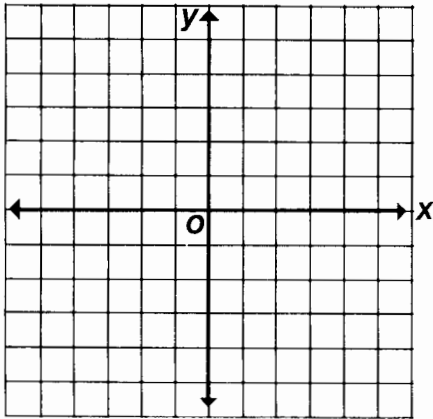
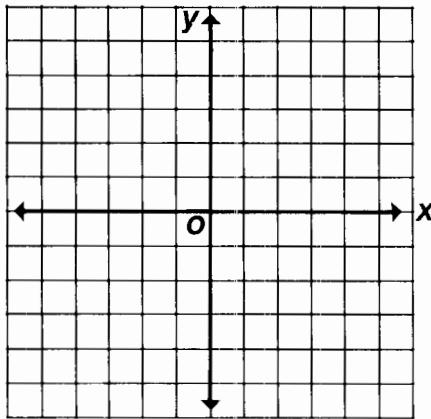


⑥ $x < -3$



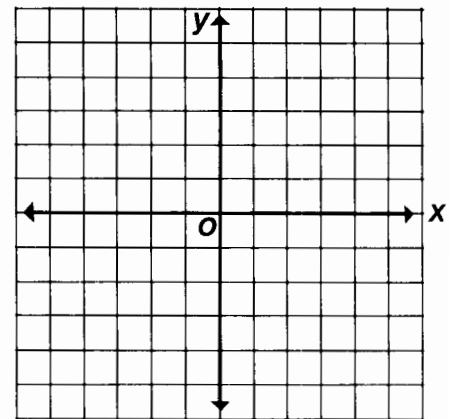
- L Quadrants I, II;
excludes boundary line.
- W Quadrants II, III;
excludes boundary line.
- G Quadrants I, III;
excludes boundary line.

⑦ $2x - 3y \leq 12$



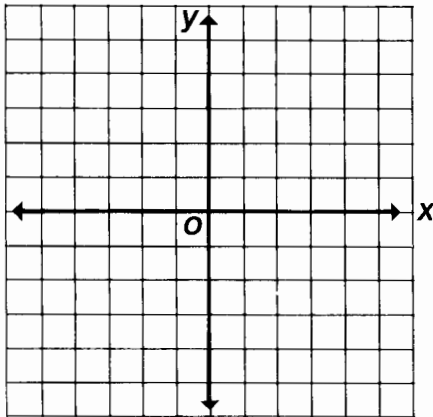
- K Quadrants I, III, IV;
excludes boundary line.
- U Quadrants II, III, IV;
includes boundary line.
- I All four quadrants;
includes boundary line.

⑧ $5x + 3y < x + 6$



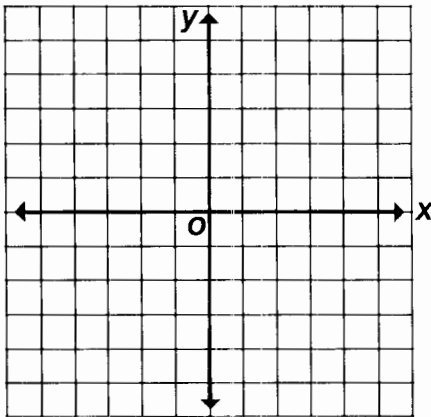
- F All four quadrants;
excludes boundary line.
- P Quadrants I, II, III;
excludes boundary line.
- M Quadrants I, III, IV;
excludes boundary line.

⑨ $3x + y > 0$



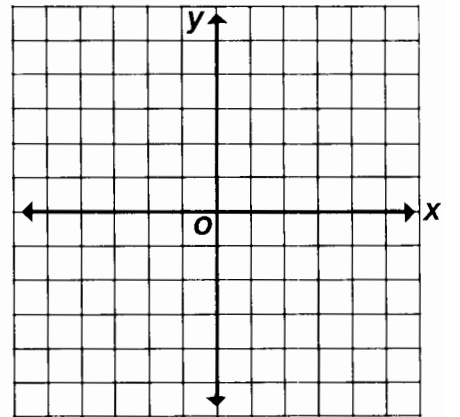
- R Quadrants I, II, IV;
excludes boundary line.
- L All four quadrants;
includes boundary line.
- M Quadrants I, III, IV;
excludes boundary line.

⑩ $2(x - y) \geq 5$



- Y All four quadrants;
excludes boundary line.
- U Quadrants II, III, IV;
includes boundary line.
- A Quadrants I, III, IV;
includes boundary line.

⑪ $5y - 2 \geq 3x - 7$



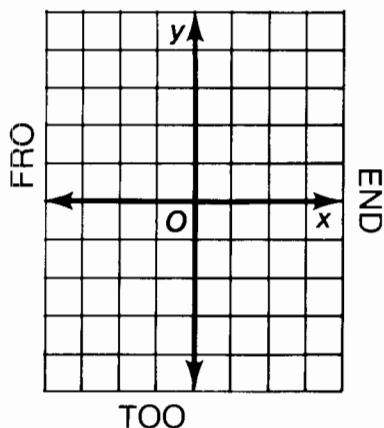
- N Quadrants I, III, IV;
excludes boundary line.
- B All four quadrants;
includes boundary line.
- D Quadrants I, II, IV;
includes boundary line.

3	5	1	7	9	8	10	3	5	1	9	6	10	2	10	11	4	10	9
---	---	---	---	---	---	----	---	---	---	---	---	----	---	----	----	---	----	---

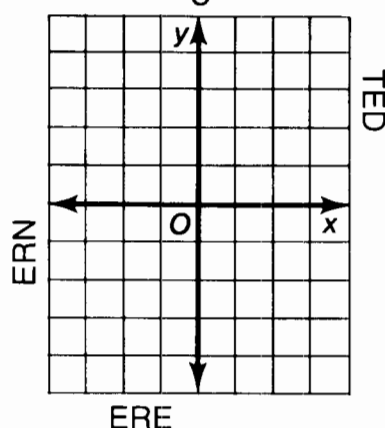
What Did the Toothless Old Termite Say When He Entered a Tavern ?

Graph each pair of inequalities below and indicate the solution set of the system with crosshatching or shading. The crosshatching or shading, if extended, would cover a set of three letters. Print these letters in the three boxes at the bottom of the page that contain the exercise number.

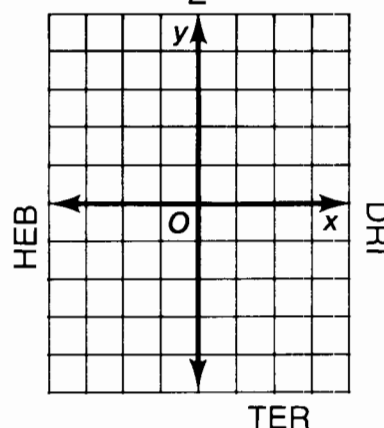
① $y \leq x - 1$
 $y \geq -3$



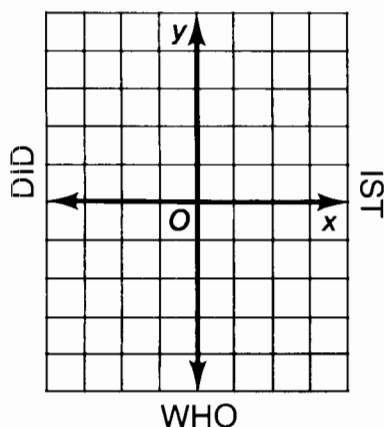
② $x \leq 2$
 $y \leq \frac{2}{3}x - 1$



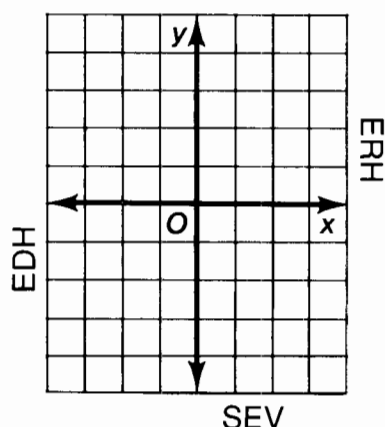
③ $y < -x + 1$
 $y > \frac{1}{2}x - 2$



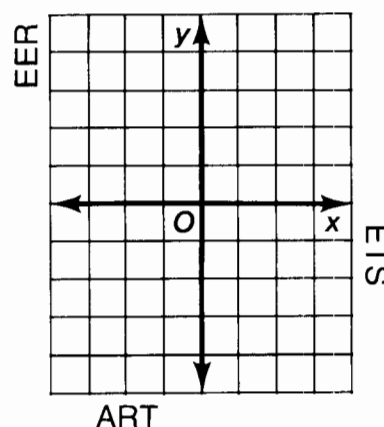
④ $y < x$
 $3x + 2y > 4$



⑤ $x - 3y \leq 12$
 $x > 2$



⑥ $y \leq 1$
 $2x + y < 1$



4	4	4	3	3	3	6	6	6	1	1	1	5	5	5	2	2	2
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Famous Last Word

$\frac{1}{130}$	$-\frac{1}{12}$	$\frac{8}{9}$	$-\overline{0.571428}$	$\frac{5}{-27}$	$0.41\overline{83}$	$\frac{7}{-33}$
$-\overline{0.227}$	0.064	$0.\overline{7}$	$\frac{2}{-11}$	$5\frac{5}{6}$		2.75
$\frac{1}{8}$	$0.\overline{27}$	$0.4\overline{161}$	$-\frac{2}{15}$	0.0625	$\frac{1}{111}$	$0.3\overline{75}$
$\frac{4}{3}$	$-\overline{0.223}$				$-\overline{0.5717}$	

A FAMOUS LAST WORD IS HIDDEN IN THE RECTANGLE ABOVE. TO FIND IT: Express each fraction below as a repeating or terminating decimal. Express each decimal as a fraction in lowest terms. Find your answers in the rectangle. Shade in each area containing a correct answer.

Express as a repeating or terminating decimal:

- ① $\frac{7}{9}$ ② $\frac{3}{8}$ ③ $\frac{5}{12}$ ④ $\frac{11}{4}$

- ⑤ $\frac{3}{11}$ ⑥ $-\frac{5}{22}$ ⑦ $\frac{1}{16}$ ⑧ $-\frac{4}{7}$

Express as a fraction in lowest terms:

- ⑨ $0.\overline{8}$ ⑩ $-\overline{0.18}$ ⑪ $1.\overline{3}$ ⑫ $-\overline{0.21}$
- ⑬ $0.12\overline{5}$ ⑭ $0.\overline{83}$ ⑮ $-\overline{0.08\overline{3}}$ ⑯ $0.\overline{009}$

Why Does Mrs. Snuggle Call Her Sons' Ranch "SOLAR FOCUS"?

Simplify each expression below and find your answer in the corresponding set of answer boxes. Print the letter of that exercise in the box containing the answer.



- (S) $\sqrt{49}$
- (T) $\sqrt{1}$
- (H) $\sqrt{100}$
- (I) $\sqrt{900}$

- (S) $-\sqrt{64}$
- (E) $-\sqrt{225}$
- (I) $-\sqrt{10,000}$
- (T) $\sqrt{\frac{9}{16}}$

- (O) $\sqrt{9^2}$
- (E) $\sqrt{25 - \sqrt{16}}$
- (E) $\sqrt{15^2}$
- (R) $(\sqrt{11})^2$
- (W) $(\sqrt{60})^2$
- (T) $\sqrt{25 - 16}$
- (H) $\sqrt{36 + 64}$
- (P) $\sqrt{36 + \sqrt{64}}$

30	1	-12	-100	7	1000	$\frac{3}{4}$	10	-15	$\frac{2}{3}$	-8	14	9	3	12	60	10	15	11	1
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- (H) $\sqrt{10^2 - \sqrt{8^2}}$
- (S) $\sqrt{10^2 - 8^2}$
- (O) $\sqrt{10^2 - 6^2}$
- (R) $\sqrt{13^2 - 12^2}$

- (E) $\sqrt{400}$
- (T) $-\sqrt{8100}$
- (N) $-\sqrt{14,400}$
- (S) $\sqrt{\frac{1}{9}}$

- (E) $-\sqrt{\frac{81}{4}}$
- (A) $\sqrt{0.25}$
- (I) $-\sqrt{0.49}$
- (E) $\sqrt{0.01}$
- (A) $-\sqrt{1.44}$
- (T) $\sqrt{0.0004}$
- (S) $-\sqrt{0.0121}$
- (M) $(\sqrt{\frac{2}{3}})^2$

-90	2	20	-200	$\frac{1}{3}$	8	-120	6	14	5	-1.2	-0.7	-0.11	$-\frac{9}{2}$	-0.9	$\frac{2}{3}$	0.1	0.5	0.02
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What Do Sea Monsters Eat?

Complete each statement below with one of the answers at the bottom of the page. Write the letter of each statement above its correct answer.

S	A number that can be written as a fraction $\frac{a}{b}$, where a and b are integers and $b \neq 0$, is a _____.
I	A fraction can be changed to a decimal by dividing the _____.
A	When a fraction is changed to a decimal and the remainder is zero, the decimal is called a _____.
D	When a fraction is changed to a decimal and the remainder is NOT zero, a digit or block of digits will eventually start to repeat. Such a decimal is called a _____.
S	Thus, since a rational number is a number that can be written as a fraction, every rational number can be expressed as either a _____ decimal.
H	The reverse is also true. Every terminating or repeating decimal represents a rational number and can be changed to a _____.
F	A number that CANNOT be expressed as a fraction $\frac{a}{b}$, where a and b are integers, is an _____.
H	Terminating and repeating decimals represent rational numbers. Therefore, the decimals for irrational numbers neither terminate nor _____.
I	Instead, the decimal for an irrational number is an endless string of digits that never repeats and never _____.
N	An example of an irrational number is _____.
P	The union of the set of rational numbers and the set of irrational numbers is called the set of _____.
S	Every decimal represents a real number, and every real number can be represented as a _____.

irrational number	terminates	rational number	fraction	0.1212121212 . . .	terminating decimal	0.1212212221 . . .	repeating decimal	integer	decimal	repeat	numerator by the denominator	real numbers	terminating or repeating



Why Didn't Krok Like to Go Sailing With the Baseball Uniform Designer?



Simplify each expression below and find your answer in the corresponding answer column. Write the letter of the exercise in the box that contains the number of the answer.

- L $\sqrt{8}$ I $\sqrt{45}$ A $\sqrt{50}$ T $\sqrt{12}$ O $\sqrt{98}$ S $\sqrt{48}$ E $\sqrt{125}$
 A $\sqrt{20}$ S $\sqrt{72}$ Y $\sqrt{63}$ E $\sqrt{144}$ W $\sqrt{32}$ D $\sqrt{75}$ A $\sqrt{200}$

- 18 $7\sqrt{2}$ 14 $5\sqrt{5}$ 12 $2\sqrt{2}$ 4 $5\sqrt{2}$ 28 $4\sqrt{3}$ 20 $2\sqrt{3}$ 25 $3\sqrt{5}$
 8 $3\sqrt{7}$ 1 $6\sqrt{2}$ 7 $10\sqrt{2}$ 6 $4\sqrt{2}$ 22 $2\sqrt{5}$ 27 12 15 $5\sqrt{3}$

- S $5\sqrt{18}$ U $3\sqrt{28}$ A $2\sqrt{1000}$ P $\sqrt{1,000,000}$
 E $3\sqrt{128}$ K $8\sqrt{27}$ L $4\sqrt{80}$ H $-3\sqrt{54}$
 A $-7\sqrt{40}$ B $-8\sqrt{121}$ S $2\sqrt{500}$ T $-4\sqrt{24}$
 Z $3\sqrt{175}$ C $5\sqrt{108}$

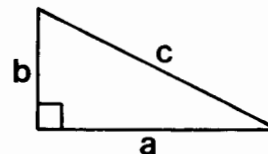
- 19 $6\sqrt{7}$ 13 $24\sqrt{3}$ 3 $24\sqrt{2}$ 9 $15\sqrt{2}$ 5 $16\sqrt{5}$ 23 1000 16 $20\sqrt{10}$
 10 $-8\sqrt{6}$ 21 $30\sqrt{3}$ 11 $-14\sqrt{10}$ 24 $20\sqrt{5}$ 26 $15\sqrt{7}$ 2 $-9\sqrt{6}$ 17 -88

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

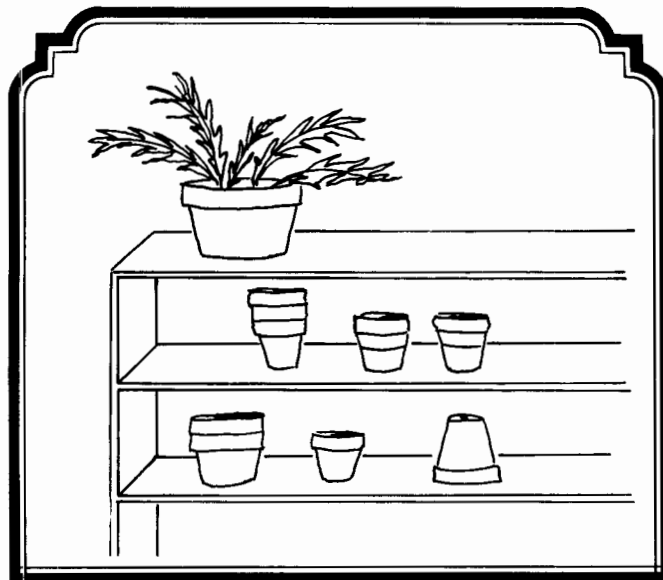


What Is the Title of This Picture?

For each exercise below, find the missing length. (Refer to the diagram at the right.) Find your answer in the answer column and notice the letter next to it. Each time the exercise number appears in the code, write this letter above it. Keep working and you will decode the title of the picture.



- ① $a = 8, b = 6, c = \underline{\hspace{2cm}}$
- ② $a = 4, b = 9, c = \underline{\hspace{2cm}}$
- ③ $a = 12, b = 12, c = \underline{\hspace{2cm}}$
- ④ $a = 7, b = \sqrt{20}, c = \underline{\hspace{2cm}}$
- ⑤ $a = \sqrt{175}, b = 15, c = \underline{\hspace{2cm}}$
- ⑥ $a = \underline{\hspace{2cm}}, b = 5, c = 10$
- ⑦ $a = 12, b = \underline{\hspace{2cm}}, c = 13$
- ⑧ $a = \underline{\hspace{2cm}}, b = \sqrt{56}, c = 14$
- ⑨ $a = 1.5, b = \underline{\hspace{2cm}}, c = 2.5$
- ⑩ $a = \sqrt{85}, b = \sqrt{59}, c = \underline{\hspace{2cm}}$
- ⑪ $a = \underline{\hspace{2cm}}, b = 6, c = \sqrt{70}$
- ⑫ $a = 40, b = \underline{\hspace{2cm}}, c = 41$
- ⑬ $a = 1, b = 1, c = \underline{\hspace{2cm}}$
- ⑭ $a = \underline{\hspace{2cm}}, b = \sqrt{2}, c = \sqrt{3}$



CODED TITLE:

$\underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}}$
 11 14 5 10 8 5 11 4 13 2 14 6
 $\underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}}$
 14 13 1 14 12 3 2 13 7 9 11 5

Ⓔ $\sqrt{400} = 20$

Ⓡ $\sqrt{67} \doteq 8.19$

Ⓢ $\sqrt{34} \doteq 5.83$

Ⓣ $\sqrt{97} \doteq 9.85$

Ⓥ $\sqrt{140} \doteq 11.83$

Ⓟ $\sqrt{81} = 9$

ⓖ $\sqrt{100} = 10$

Ⓞ $\sqrt{288} \doteq 16.97$

Ⓛ $\sqrt{144} = 12$

ⓗ $\sqrt{1} = 1$

Ⓝ $\sqrt{25} = 5$

Ⓢ $\sqrt{2} \doteq 1.41$

Ⓦ $\sqrt{69} \doteq 8.31$

Ⓤ $\sqrt{4} = 2$

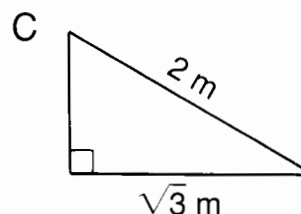
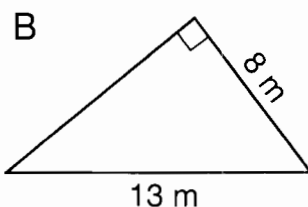
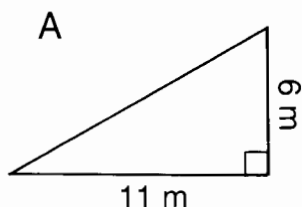
Ⓐ $\sqrt{75} \doteq 8.66$

How Do You Write a Song That Will Knock Over a Cow?



Solve each problem below. Cross out the box that contains your answer. When you finish, print the letters from the remaining boxes in the spaces at the bottom of the page.

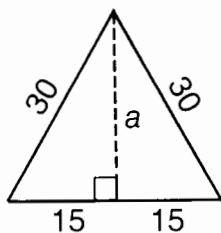
- ① For each right triangle, find the length of the side that is not given:



- ② A rectangle is 7 cm wide and 10 cm long. Find the length of a diagonal of the rectangle.

- ⑤ A 20-foot ladder is leaned against a wall. If the base of the ladder is 8 feet from the wall, how high up on the wall will the ladder reach?

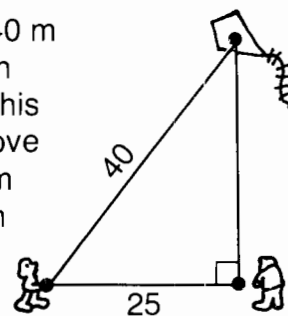
- ③ Each side of an equilateral triangle measures 30 cm. Find the length of an altitude, a , of the triangle.



- ⑥ The bases of a softball diamond are 60 feet apart. How far is it from home plate to second base?

- ④ A television set may be described in terms of the diagonal measure of its screen. If a TV screen is 16 inches by 12 inches, what is the length of its diagonal?

- ⑦ Jack has let out 40 m of kite string when he observes that his kite is directly above Jill. If Jack is 25 m from Jill, how high is the kite?



BY $\sqrt{7200}$ ft $\doteq 84.9$ ft	IN $\sqrt{123}$ m $\doteq 11.1$ m	SO $\sqrt{105}$ m $\doteq 10.2$ m	TH $\sqrt{675}$ cm $\doteq 26.0$ cm	BE $\sqrt{6400}$ ft $= 80$ ft	AT $\sqrt{975}$ m $\doteq 31.2$ m	ER $\sqrt{149}$ cm $\doteq 12.2$ cm
EF $\sqrt{850}$ m $\doteq 29.2$ m	OR $\sqrt{336}$ ft $\doteq 18.3$ ft	NG $\sqrt{157}$ m $\doteq 12.5$ m	FL $\sqrt{425}$ cm $\doteq 20.6$ cm	IT $\sqrt{1}$ m $= 1$ m	BE $\sqrt{400}$ in. $= 20$ in.	AT $\sqrt{380}$ in. $\doteq 19.5$ in.

Do Elephants Know How to Gamble?



Simplify each expression below. Assume that all variables represent nonnegative numbers. Find your answer in the corresponding set of answer boxes. Print the letter of the exercise in the box above the answer.

T $\sqrt{9x^2}$

E $-\sqrt{49x^2}$

A $\sqrt{4x^2y^2}$

H $\sqrt{12x^2}$

O $-\sqrt{45x^2}$

T $\sqrt{25y^4}$

E $-\sqrt{28x^4}$

Y $\sqrt{16xy^2}$

V $-\sqrt{20xy^2}$

D $\sqrt{7x^2y}$

H $\sqrt{9x^2y^4}$

N $\sqrt{24x^4y^2}$

$5y^2$	$2x\sqrt{3}$	$-7x$	$4\sqrt{x}$	$2xy\sqrt{6y}$	$x\sqrt{7y}$	$-3x\sqrt{5}$	$2x^2y\sqrt{6}$	$3x$	$3x^2y^3$	$3xy^2$	$2xy$	$-2y\sqrt{5x}$	$-2x^2\sqrt{7}$
--------	--------------	-------	-------------	----------------	--------------	---------------	-----------------	------	-----------	---------	-------	----------------	-----------------

E $\sqrt{a^3}$

T $-\sqrt{40a^3}$

A $\sqrt{54a^3b^2}$

E $\sqrt{75a^2b^3}$

I $\sqrt{144b^6}$

E $-\sqrt{1000a^6}$

S $\sqrt{18a^6b^2}$

H $\sqrt{15a^8b^3}$

A $\sqrt{a^5b^8}$

V $2\sqrt{50ab^5}$

D $8\sqrt{300a^4b^6}$

G $5\sqrt{98a^{20}b^3}$

$-2a\sqrt{10a}$	$a^4b\sqrt{15b}$	$-10a^3\sqrt{10}$	$40ab^3\sqrt{3}$	$10b^2\sqrt{2ab}$	$a\sqrt{a}$	$35a^{10}b\sqrt{2b}$	$3ab\sqrt{6a}$	$3ab\sqrt{2}$	$a^2b^2\sqrt{5}$	$12b^3$	$80a^2b^3\sqrt{3}$	$5ab\sqrt{3b}$	$a^2b^4\sqrt{a}$
-----------------	------------------	-------------------	------------------	-------------------	-------------	----------------------	----------------	---------------	------------------	---------	--------------------	----------------	------------------

Do Elephants Know How to Gamble?



Simplify each expression below. Assume that each radicand is nonnegative. Find your answer in the corresponding set of answer boxes. Print the letter of the exercise in the box above the answer.

(T) $\sqrt{9x^2}$

(E) $-\sqrt{49x^2}$

(A) $\sqrt{4x^2y^2}$

(H) $\sqrt{12x^2}$

(O) $-\sqrt{45x^2}$

(T) $\sqrt{25y^4}$

(E) $-\sqrt{28x^4}$

(Y) $\sqrt{16xy^2}$

(V) $-\sqrt{20xy^2}$

(D) $\sqrt{7x^2y}$

(H) $\sqrt{9x^2y^4}$

(N) $\sqrt{24x^4y^2}$

$5y^2$	$2 x \sqrt{3}$	$-7 x $	$4 y \sqrt{x}$	$2xy\sqrt{6y}$	$ x \sqrt{7y}$	$-3 x \sqrt{5}$	$2x^2 y \sqrt{6}$	$3 x $	$3x^2y^3$	$3 x y^2$	$2 xy $	$-2 y \sqrt{5x}$	$-2x^2\sqrt{7}$

(E) $\sqrt{a^3}$

(T) $-\sqrt{40a^3}$

(A) $\sqrt{54a^3b^2}$

(E) $\sqrt{75a^2b^3}$

(I) $\sqrt{144b^6}$

(E) $-\sqrt{1000a^6}$

(S) $\sqrt{18a^6b^2}$

(H) $\sqrt{15a^8b^3}$

(A) $\sqrt{a^5b^8}$

(V) $2\sqrt{50ab^5}$

(D) $8\sqrt{300a^4b^6}$

(G) $5\sqrt{98a^{20}b^3}$

$-2a\sqrt{10a}$	$a^4b\sqrt{15b}$	$-10 a^3 \sqrt{10}$	$40 ab^3 \sqrt{3}$	$10b^2\sqrt{2ab}$	$a\sqrt{a}$	$35a^{10}b\sqrt{2b}$	$3 a b\sqrt{6a}$	$3 a^3b \sqrt{2}$	$a^2b^2\sqrt{5}$	$12 b^3 $	$80a^2 b^3 \sqrt{3}$	$5 a b\sqrt{3b}$	$a^2b^4\sqrt{a}$

OBJECTIVE 3-h: To simplify square roots with variables in the radicand (assuming that all radicands, but not necessarily all variables, are nonnegative).

What Do You Call a Group of Factory Foremen Who Sing While Drinking Tab Cola and Eating Crab Apples ?

Simplify each expression below. Assume that all variables represent nonnegative numbers. Find your answer in the corresponding answer column. Write the letter of the exercise in the box that contains the number of the answer.

- | | | | |
|---------------------------------------|---------------------|---|--------------------------|
| (E) $\sqrt{5} \cdot \sqrt{3}$ | (7) $2x^2\sqrt{6}$ | (N) $5\sqrt{2} \cdot 4\sqrt{3}$ | (25) $30\sqrt{2}$ |
| (H) $\sqrt{6} \cdot \sqrt{2}$ | (2) $10\sqrt{2}$ | (B) $-7\sqrt{3} \cdot 2\sqrt{10}$ | (11) $5a^2\sqrt{3b}$ |
| (O) $\sqrt{3} \cdot \sqrt{6}$ | (3) $12x^5$ | (I) $2\sqrt{6} \cdot 5\sqrt{3}$ | (8) $-14\sqrt{15}$ |
| (A) $\sqrt{5} \cdot \sqrt{10}$ | (9) $\sqrt{15}$ | (A) $4\sqrt{10} (-3\sqrt{2})$ | (4) $36ab\sqrt{6b}$ |
| (R) $\sqrt{27} \cdot \sqrt{3}$ | (12) $x\sqrt{6}$ | (R) $2\sqrt{8} \cdot \sqrt{18}$ | (17) $-24\sqrt{5}$ |
| (H) $\sqrt{10} \cdot \sqrt{20}$ | (5) $3\sqrt{2}$ | (L) $-10\sqrt{3} (-2\sqrt{21})$ | (15) $18ab$ |
| (E) $\sqrt{90} \cdot \sqrt{40}$ | (1) $3x^2\sqrt{10}$ | (M) $-\sqrt{6} \cdot 7\sqrt{10}$ | (22) $40a^2b^4\sqrt{6a}$ |
| (A) $\sqrt{2x} \cdot \sqrt{3x}$ | (23) $2\sqrt{3}$ | (N) $3\sqrt{ab} \cdot 6\sqrt{ab}$ | (6) 24 |
| (D) $\sqrt{6x} \cdot \sqrt{2x}$ | (26) 9 | (P) $\sqrt{2ab^2} \cdot \sqrt{14ab^2}$ | (10) $20\sqrt{6}$ |
| (T) $\sqrt{30x^2} \cdot \sqrt{3x^2}$ | (21) 60 | (T) $-\sqrt{15a^2b} (-\sqrt{5a^2})$ | (19) $2ab^2\sqrt{7}$ |
| (E) $\sqrt{3x} \cdot \sqrt{8x^3}$ | (18) $20x\sqrt{x}$ | (O) $\sqrt{8ab^2} (-\sqrt{10a^3b^4})$ | (13) $-14\sqrt{30}$ |
| (P) $\sqrt{40x^2} \cdot \sqrt{10x}$ | (14) $5\sqrt{2}$ | (F) $2\sqrt{18a^2b} \cdot 6\sqrt{3b^2}$ | (24) $-4a^2b^3\sqrt{5}$ |
| (E) $\sqrt{12x^5} \cdot \sqrt{12x^5}$ | (16) $2x\sqrt{3}$ | (C) $5\sqrt{2a^3b^8} \cdot 4\sqrt{12a^2}$ | (20) $60\sqrt{7}$ |

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

What Should You Do If Nobody Will Sing With You?



Simplify each expression. Find your answer below the exercise and notice the letter next to it. Write this letter in the box at the bottom of the page that contains the number of that exercise.

- ① $2\sqrt{5} + 4\sqrt{5}$
- ② $7\sqrt{3} - 3\sqrt{3}$
- ③ $2\sqrt{6} - 7\sqrt{6}$
- ④ $5\sqrt{x} + \sqrt{x}$
- ⑤ $9\sqrt{5} - 8\sqrt{5}$

- ⑥ $5\sqrt{10} + 4\sqrt{10} - \sqrt{10}$
- ⑦ $2\sqrt{3} - 6\sqrt{3} - 3\sqrt{3}$
- ⑧ $6\sqrt{7} + 3\sqrt{3} - 2\sqrt{7}$
- ⑨ $\sqrt{2} - 4\sqrt{6} + 5\sqrt{2} + \sqrt{6}$
- ⑩ $3\sqrt{a} + 9\sqrt{b} - \sqrt{b} - 2\sqrt{a}$

- Ⓕ $4\sqrt{5}$ Ⓔ $4\sqrt{3}$
- Ⓘ $6\sqrt{x}$ Ⓡ $3\sqrt{x}$
- Ⓣ $6\sqrt{5}$ Ⓝ $6\sqrt{3}$
- Ⓐ $\sqrt{5}$ Ⓤ $-5\sqrt{6}$

- ⓓ $8\sqrt{3}$ Ⓢ $4\sqrt{2} - \sqrt{6}$
- Ⓔ $8\sqrt{10}$ ⓕ $4\sqrt{7} + 3\sqrt{3}$
- Ⓡ $\sqrt{a} + 8\sqrt{b}$ Ⓐ $3\sqrt{a} + 7\sqrt{b}$
- Ⓣ $-7\sqrt{3}$ Ⓨ $6\sqrt{2} - 3\sqrt{6}$



- ⑪ $3\sqrt{12} + 4\sqrt{3}$
- ⑫ $8\sqrt{5} - 2\sqrt{45}$
- ⑬ $7\sqrt{18} + 2\sqrt{50}$
- ⑭ $6\sqrt{24} - 5\sqrt{54}$
- ⑮ $-\sqrt{27} + 4\sqrt{48}$

- ⑯ $5\sqrt{8} + \sqrt{98} - 2\sqrt{18}$
- ⑰ $2\sqrt{90} - 3\sqrt{20} + \sqrt{40}$
- ⑱ $4\sqrt{63} - 9\sqrt{28} + 2\sqrt{44}$
- ⑲ $2\sqrt{27x} + \sqrt{75x} + 5\sqrt{12x}$
- ⑳ $-6\sqrt{9x} + 3\sqrt{64x} - \sqrt{50x}$

- Ⓡ $-3\sqrt{6}$ Ⓔ $10\sqrt{3}$
- Ⓢ $-4\sqrt{3}$ Ⓛ $2\sqrt{6}$
- Ⓣ $2\sqrt{5}$ Ⓝ $13\sqrt{3}$
- Ⓔ $24\sqrt{2}$ Ⓞ $31\sqrt{2}$

- Ⓑ $8\sqrt{3x}$ Ⓤ $6\sqrt{x} - 5\sqrt{2x}$
- Ⓛ $11\sqrt{2}$ Ⓢ $-6\sqrt{7} + 4\sqrt{11}$
- Ⓢ $\sqrt{10} - 9\sqrt{5}$ Ⓓ $8\sqrt{10} - 6\sqrt{5}$
- Ⓚ $21\sqrt{3x}$ Ⓟ $3\sqrt{7} + \sqrt{11}$

10	2	15	7	5	17	20	11	1	9	13	3	14	18	6	16	8	19	4	12
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Did you hear about...

A	B	C	D	E	F	G	H
I	J	K	L	M	N	O	P
							?

Answers A–H:

$\sqrt{11}$	TO
$\frac{\sqrt{5}}{2}$	WAS
$\frac{\sqrt{2}}{6}$	HUG
$\frac{2\sqrt{10}}{5}$	TRIED
$4\sqrt{5}$	SAD
$\frac{5\sqrt{3}}{3}$	THE
$\frac{3\sqrt{5}}{10}$	BIG
$\frac{\sqrt{6}}{2}$	WHO
$\frac{\sqrt{3}}{2}$	KISS
$\frac{2\sqrt{7}}{7}$	VERY
$7\sqrt{2}$	GUY
$\frac{2\sqrt{6}}{3}$	GIRL

Rationalize the denominator and simplify each expression below. Find your answer in the adjacent answer column and notice the word next to it. Write this word in the box containing the letter of that exercise. Keep working and you will hear about a mistake.

- | | |
|----------------------------|-----------------------------------|
| (A) $\frac{5}{\sqrt{3}}$ | (I) $\frac{30}{\sqrt{18}}$ |
| (B) $\frac{2}{\sqrt{7}}$ | (J) $\frac{8}{\sqrt{20}}$ |
| (C) $\frac{20}{\sqrt{5}}$ | (K) $\frac{9}{2\sqrt{45}}$ |
| (D) $\frac{14}{\sqrt{2}}$ | (L) $\frac{\sqrt{7}}{\sqrt{3}}$ |
| (E) $\frac{3}{\sqrt{6}}$ | (M) $\frac{\sqrt{5}}{\sqrt{10}}$ |
| (F) $\frac{4}{\sqrt{10}}$ | (N) $\frac{3\sqrt{6}}{\sqrt{2}}$ |
| (G) $\frac{11}{\sqrt{11}}$ | (O) $\frac{\sqrt{3}}{2\sqrt{6}}$ |
| (H) $\frac{3}{\sqrt{12}}$ | (P) $\frac{2\sqrt{3}}{\sqrt{15}}$ |

Answers I–P:

$\frac{3\sqrt{2}}{4}$	BUT
$\frac{\sqrt{2}}{4}$	AND
$\frac{\sqrt{21}}{3}$	IN
$\frac{4\sqrt{5}}{5}$	GIRL
$\frac{6\sqrt{2}}{5}$	LOST
$3\sqrt{3}$	FOG
$\frac{3\sqrt{5}}{10}$	FRIEND
$\frac{\sqrt{2}}{2}$	THE
$5\sqrt{2}$	HIS
$\frac{2\sqrt{2}}{5}$	A
$\frac{2\sqrt{5}}{5}$	MIST
$\frac{9\sqrt{3}}{10}$	TODAY

What Did Bimbo Airhead Reply When Asked, "What Is the Difference Between Ignorance and Apathy?"

Simplify each expression below. Assume that all variables represent nonnegative numbers. Cross out the box that contains your answer. When you finish, print the letters from the remaining boxes in the spaces at the bottom of the page.

- | | | | |
|---|---|--|---|
| <p>① $\sqrt{3} \cdot \sqrt{15}$</p> <p>② $\sqrt{10x} \cdot \sqrt{5x^3}$</p> <p>③ $7\sqrt{3} + \sqrt{48}$</p> <p>④ $\frac{24}{\sqrt{6}}$</p> | <p>⑤ $-5\sqrt{3} \cdot 4\sqrt{6}$</p> <p>⑥ $\sqrt{2xy^2} \cdot \sqrt{10xy}$</p> <p>⑦ $8\sqrt{x} + 3\sqrt{y} - \sqrt{x}$</p> <p>⑧ $\frac{12}{\sqrt{30}}$</p> | <p>⑨ $\frac{\sqrt{5}}{\sqrt{40}}$</p> <p>⑩ $\sqrt{3nt^5} \cdot \sqrt{12n^2t}$</p> <p>⑪ $5\sqrt{24} - 8\sqrt{150}$</p> <p>⑫ $\frac{4\sqrt{10}}{\sqrt{6}}$</p> | <p>⑬ $3\sqrt{2n^3t^5} \cdot 5\sqrt{14n^5}$</p> <p>⑭ $7\sqrt{12} - 5\sqrt{27} + 6\sqrt{300}$</p> <p>⑮ $4\sqrt{44} + 2\sqrt{22} + 9\sqrt{99}$</p> <p>⑯ $\frac{3\sqrt{2}}{2\sqrt{75}}$</p> |
|---|---|--|---|

Answers for exercises 1–8:

TH	IDO	ERE	THE
$2xy\sqrt{5y}$	$\frac{3\sqrt{30}}{10}$	$4\sqrt{6}$	$\frac{2\sqrt{30}}{5}$
SO	DUM	NOW	BAS
$7\sqrt{x} + 3\sqrt{y}$	$11\sqrt{3}$	$9\sqrt{2xy}$	$3\sqrt{5}$
ON	TOP	IT	TCA
$-30\sqrt{3}$	$-60\sqrt{2}$	$5x^2\sqrt{2}$	$9\sqrt{6}$

Answers for exercises 9–16:

ONE	WA	NTK	ISS
$30n^4t^2\sqrt{7t}$	$-30\sqrt{6}$	$\frac{2\sqrt{30}}{3}$	$\frac{\sqrt{6}}{10}$
AN	AS	AYS	DID
$24n^2t^3\sqrt{2t}$	$6nt^3\sqrt{n}$	$59\sqrt{3}$	$42\sqrt{11}$
USE	ME	RE	ST
$35\sqrt{11} + 2\sqrt{22}$	$\frac{\sqrt{2}}{4}$	$36\sqrt{3}$	$\frac{4\sqrt{15}}{3}$



What Do You Call King Kong When He Dresses Up Like a Pilot?



Simplify each expression below and find your answer at the bottom of the page. Print the letter of that exercise in the box above the answer.

Ⓢ $\sqrt{\frac{3}{7}}$

Ⓔ $\sqrt{\frac{2}{3}} \cdot \sqrt{\frac{3}{4}}$

Ⓣ $\sqrt{2\frac{2}{3}} \cdot \sqrt{1\frac{1}{5}}$

Ⓔ $\sqrt{\frac{5}{12}}$

Ⓐ $\sqrt{\frac{10}{3}} \cdot \sqrt{\frac{9}{5}}$

Ⓢ $\sqrt{1\frac{1}{8}} \cdot \sqrt{3\frac{1}{3}}$

Ⓡ $\sqrt{\frac{9}{20}}$

Ⓕ $\sqrt{\frac{5}{6}} \cdot \sqrt{\frac{5}{2}}$

Ⓜ $2\sqrt{\frac{5}{24}}$

Ⓞ $\sqrt{\frac{8}{27}}$

Ⓡ $\sqrt{\frac{3}{5}} \cdot \sqrt{\frac{1}{10}}$

Ⓚ $5\sqrt{2\frac{7}{10}}$

Ⓢ $\sqrt{\frac{18}{5}}$

Ⓔ $\sqrt{\frac{3}{7}} \cdot \sqrt{\frac{7}{12}}$

Ⓓ $4\sqrt{2\frac{3}{16}} \cdot \sqrt{1\frac{2}{5}}$

$\frac{\sqrt{30}}{6}$	$\frac{\sqrt{21}}{7}$	$\frac{\sqrt{2}}{2}$	$\frac{2\sqrt{2}}{5}$	$\frac{5\sqrt{3}}{6}$	7	$\frac{\sqrt{3}}{10}$	$\frac{3\sqrt{30}}{2}$	$1\frac{1}{2}$	$\frac{\sqrt{15}}{2}$	$\frac{3\sqrt{5}}{10}$	$\frac{3\sqrt{10}}{5}$		
$\sqrt{6}$	$\frac{4\sqrt{5}}{5}$	$\frac{\sqrt{6}}{10}$	$\frac{2\sqrt{6}}{9}$	$\frac{15}{2}$	$\frac{\sqrt{15}}{6}$								

Why Was the Pail Pale?



Simplify each expression. Find your answer below and notice the letter next to it. Write this letter in each box containing the number of that exercise.

① $7\sqrt{2} + \sqrt{50} - 2\sqrt{18}$

② $\sqrt{7} + \frac{\sqrt{7}}{2}$

③ $\sqrt{3} + \sqrt{\frac{1}{3}}$

④ $3\sqrt{\frac{1}{2}} + \sqrt{2}$

⑤ $2\sqrt{5} + 3\sqrt{\frac{1}{5}}$

⑥ $10\sqrt{\frac{3}{5}} - 24\sqrt{\frac{5}{3}}$

⑦ $\sqrt{\frac{3}{2}} + 3\sqrt{\frac{1}{6}}$

⑧ $5\sqrt{\frac{1}{2}} - 2\sqrt{\frac{1}{8}}$

⑨ $\sqrt{\frac{3}{8}} + \sqrt{\frac{2}{3}}$

⑩ $\sqrt{\frac{3}{4}} + \sqrt{12}$

⑪ $7\sqrt{10} - 2\sqrt{90} + 4\sqrt{\frac{1}{10}}$

⑫ $3\sqrt{\frac{2}{9}} + \frac{1}{2}\sqrt{32} + \sqrt{\frac{9}{8}}$

Answers:

Ⓒ $\frac{5\sqrt{2}}{2}$

Ⓐ $\frac{4\sqrt{3}}{3}$

Ⓓ $\frac{7\sqrt{2}}{3}$

Ⓔ $\frac{13\sqrt{5}}{5}$

Ⓔ $6\sqrt{2}$

Ⓓ $9\sqrt{5}$

Ⓓ $-6\sqrt{15}$

Ⓒ $\frac{3\sqrt{7}}{2}$

Answers:

Ⓕ $\frac{7\sqrt{2}}{2}$

Ⓚ $\frac{5\sqrt{3}}{2}$

Ⓙ $\frac{7\sqrt{6}}{12}$

Ⓜ $3\sqrt{10}$

Ⓦ $\frac{15\sqrt{2}}{4}$

Ⓛ $\frac{7\sqrt{10}}{5}$

Ⓜ $\sqrt{6}$

Ⓑ $2\sqrt{2}$

7	9	12	3	1	6	9	3	12	5	11	11	8	2	4	10	5	9
---	---	----	---	---	---	---	---	----	---	----	----	---	---	---	----	---	---

What Do You Get When You Cross...

1. A thief with a cement truck?

5 14 5 12 9 2 13 2 9 11 12 15 7 15 13 5 10

2. A supermarket with a jungle?

11 14 2 11 4 1 8 3 10 15 1 13 6

Express each product below in simplest form. Find your answer and notice the letter next to it. Each time the exercise number appears in the code, write this letter above it. Keep working and you will discover the result of each "double cross."

① $(5 - \sqrt{2})(5 + \sqrt{2})$

Ⓚ 4

Ⓞ 23

② $(7 + \sqrt{3})(7 - \sqrt{3})$

ⓖ -14

Ⓣ -26

③ $(\sqrt{10} - 6)(\sqrt{10} + 6)$

ⓔ 46

④ $(\sqrt{10} - \sqrt{6})(\sqrt{10} + \sqrt{6})$

ⓐ $26 + 11\sqrt{2}$

⑤ $(\sqrt{2} + 8)(\sqrt{2} + 3)$

Ⓟ $30 + 9\sqrt{2}$



⑥ $(\sqrt{13} + 1)(\sqrt{13} - 5)$

ⓓ $6\sqrt{3} + 6$

Ⓥ $7\sqrt{15}$

⑦ $(6 - \sqrt{15})(3 - \sqrt{15})$

Ⓢ $8 - 4\sqrt{13}$

Ⓑ $9\sqrt{3}$

⑧ $(9 + \sqrt{7})^2$

Ⓤ $88 + 18\sqrt{7}$

⑨ $3\sqrt{2}(\sqrt{6} + \sqrt{2})$

Ⓛ $14\sqrt{15} - 10\sqrt{2}$

⑩ $2\sqrt{5}(7\sqrt{3} - \sqrt{10})$

Ⓜ $33 - 9\sqrt{15}$



⑪ $5\sqrt{3}(2\sqrt{15} + \sqrt{8})$

Ⓨ $8 + 6\sqrt{7}$

Ⓛ $16\sqrt{5}$

⑫ $3\sqrt{6}(4\sqrt{3} - 2\sqrt{15})$

ⓗ $26 - 2\sqrt{7}$

Ⓕ $11\sqrt{5}$

⑬ $(8 + 3\sqrt{5})(1 + 2\sqrt{5})$

Ⓝ $38 + 19\sqrt{5}$

⑭ $(2\sqrt{7} + 4)(5\sqrt{7} - 11)$

Ⓒ $30\sqrt{5} + 10\sqrt{6}$

⑮ $(3\sqrt{10} - 5\sqrt{2})(2\sqrt{10} + 6\sqrt{2})$

Ⓡ $36\sqrt{2} - 18\sqrt{10}$

Why Is a Duplicate Key Like a Small Cake ?

Solve each equation below. (Be sure to check each apparent solution in the original equation.) Cross out the box that contains your solution. When you finish, print the letters from the remaining boxes in the spaces at the bottom of the page.

<p>① $\sqrt{x} = 8$</p> <p>② $\sqrt{4y} = 10$</p> <p>③ $\sqrt{6x} = 12$</p> <p>④ $\sqrt{\frac{x}{5}} = 3$</p> <p>⑤ $\sqrt{\frac{a}{3}} = 10$</p> <p>⑥ $\sqrt{x} + 7 = 11$</p>	<p>⑦ $\sqrt{3x} - 1 = 5$</p> <p>⑧ $\sqrt{5y} + 3 = 7$</p> <p>⑨ $\sqrt{2b} + 4 = 8$</p> <p>⑩ $\sqrt{6x + 1} + 9 = 16$</p> <p>⑪ $\sqrt{3n} + 8 - 5 = 0$</p> <p>⑫ $\sqrt{4t - 7} + 4 = 1$</p>	<p>⑬ $\sqrt{\frac{x}{6}} + 2 = 7$</p> <p>⑭ $\sqrt{\frac{2m}{3}} + 6 = 9$</p> <p>⑮ $\sqrt{x} = 7\sqrt{2}$</p> <p>⑯ $\sqrt{4y - 3} = \sqrt{41}$</p> <p>⑰ $\sqrt{5x - 7} = \sqrt{3x + 3}$</p> <p>⑱ $4\sqrt{a} = \sqrt{4a + 27}$</p>																																																
Answers for exercises 1–6:	Answers for exercises 7–12:	Answers for exercises 13–18:																																																
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What Is the Advantage of Having Nuclear Physics?

Solve each equation and problem below. (Be sure to check each apparent solution in the original equation.) Find your answer and notice the two letters next to it. Write these letters in the two boxes above the exercise number at the bottom of the page.

① $\sqrt{x} + 4 = 14$

② $\sqrt{3a} - 1 = 5$

③ $\sqrt{8y} = \frac{1}{2}$

④ $\sqrt{3n} = \frac{2}{5}$

- ⑤ The square root of one fourth of a number is 6. Find the number.

Answers:

- AB $\frac{8}{25}$ BE 24 EN 180
 ND 144 ET 28 DY $\frac{1}{32}$
 AN 500 EO $\frac{4}{75}$

⑥ $\sqrt{5k} + 2 + 8 = 11$

⑦ $\sqrt{7d} - 9 = \sqrt{2d} + 21$

⑧ $\sqrt{x^2 + 3x} = 2$

⑨ $\sqrt{3w} + 10 - w = 0$

- ⑩ When 11 is subtracted from twice a number, the square root of the result is 4. Find the number.

Answers:

- ST 9 TH $\{1, -4\}$
 IT 6 IS $\frac{27}{2}$
 CL 5 AF $\{2, -3\}$
 CH $\frac{13}{5}$ ER $\frac{7}{5}$

⑪ $\sqrt{x-3} = x-3$

⑫ $x + 2 = \sqrt{18-x}$

⑬ $y = 5 + \sqrt{3y-5}$

⑭ $\sqrt{7m} + 25 - m = 1$

- ⑮ Three times the square root of a number is the same as 4 less than the number. Find the number.

Answers:

- OU 8 FI -7
 ND 25 TH $\{3, 4\}$
 TT 10 LD 16
 KI 2 AT $\{5, -3\}$

7	10	2	13	6	11	1	8	4	15	9	14	3	12	5				

Moving Words

Solve each equation in the top block and find the solution set in the bottom block. (One equation has no solution.)
Transfer the word from the top box to the corresponding bottom box.

① $x^2 = 81$ TO	⑥ $y^2 - 49 = 0$ MAKE	⑪ $4x^2 - 200 = -20$ THE	⑫ $(x - 2)^2 = 28$ STUDENTS
② $a^2 = 20$ WAS	⑦ $x^2 - 16 = 8$ ONCE	⑫ $7y^2 + 18 = 4$ THERE	⑬ $3(x - 5)^2 = 12$ TEACHER
③ $3n^2 = 45$ IN	⑧ $b^2 + 11 = 86$ TEN	⑬ $(x - 1)^2 = 9$ LAUGH	⑭ $5(n + 1)^2 = 40$ TEN
④ $7x^2 = 84$ WHO	⑨ $2x^2 - 3 = 15$ NO	⑭ $(a + 3)^2 = 25$ TOLD	⑮ $(2x - 3)^2 = 81$ JOKES
⑤ $2v^2 = 180$ BUT	⑩ $5w^2 + 8 = 58$ A	⑮ $(t - 4)^2 = 7$ DID	⑯ $(4t + 1)^2 = 49$ PUN
no solution	$\{\pm 2\sqrt{6}\}$	$\{\pm 2\sqrt{5}\}$	$\{\pm \sqrt{10}\}$
$\{\pm 2\sqrt{3}\}$	$\{2, -8\}$	$\{\pm 5\sqrt{3}\}$	$\{6, -3\}$
$\{\pm 7\}$	$\{\pm 2\sqrt{3}\}$	$\{2 \pm 2\sqrt{7}\}$	$\{4, -2\}$
$\{\pm 3\}$	$\{\frac{3}{2}, -2\}$	$\{\pm \sqrt{15}\}$	$\{-1 \pm 2\sqrt{2}\}$
			$\{7, 3\}$
			$\{\pm 9\}$
			$\{\pm 3\sqrt{10}\}$
			$\{4 \pm \sqrt{7}\}$

What Do You Get When You Cross a Cooking Utensil With a Mathematical Formula?

Solve each equation below. Find the solution set at the bottom of the page and cross out the letter above it. When you finish, the answer to the title question will remain.

① $(x - 4)^2 = 25$

② $5(x + 7)^2 = 5$

③ $3(x - 2)^2 = 36$

④ $x^2 - 10x + 25 = 9$

⑤ $x^2 - 6x + 9 = 49$

⑥ $x^2 + 2x + 1 = 64$

⑦ $x^2 - 18x + 81 = 24$

⑧ $x^2 + 12x + 36 = 75$

⑨ $(x - \frac{1}{2})^2 = 1$

⑩ $(x - \frac{3}{2})^2 = \frac{7}{4}$

⑪ $(x + \frac{5}{2})^2 = \frac{15}{4}$

⑫ $2x^2 = 5$

⑬ $(x - \frac{1}{2})^2 = \frac{3}{2}$

⑭ $(x - \frac{3}{5})^2 = \frac{4}{5}$

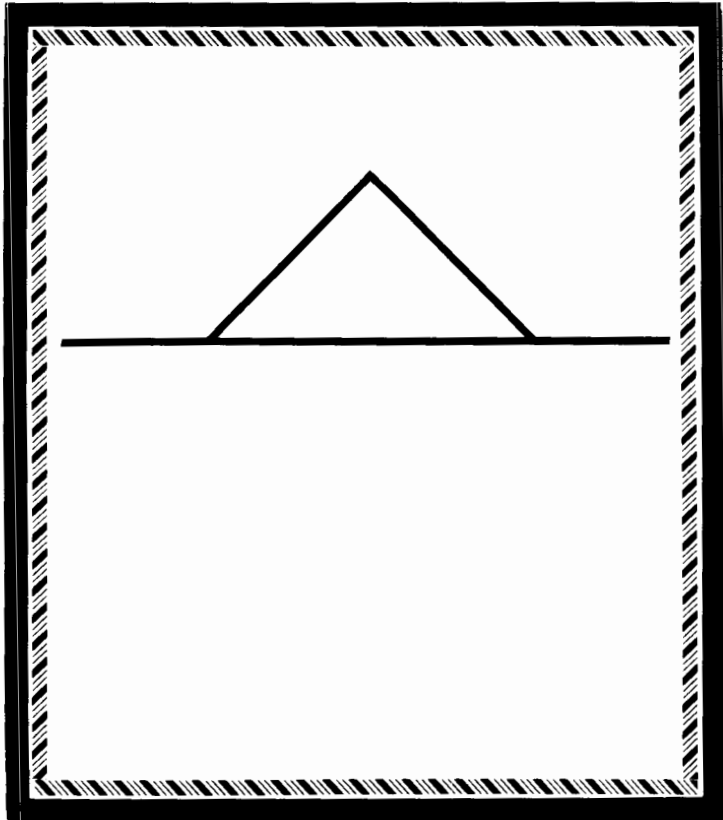
⑮ $3(x + \frac{7}{3})^2 = 1$

S	T	C	A	H	S	P	E	A	O	L	I	T	I	P	A	D	N	I	X	H
{2, 8}	{9 ± 2√6}	{-8, -6}	{±√30 6}	{-1, 9}	{-7 ± √3 3}	{1 ± 4√5 5}	{-6 ± 5√3}	{3 ± 2√5 5}	{-7 ± √6 2}	{-4, 10}	{1 3, 2 2}	{-3, 5}	{±√10 2}	{-6 ± 2√7}	{-5 ± √15 2}	{2 ± 2√3}	{3 ± √7 2}	{9 ± 3√5}	{1 ± √6 2}	{-9, 7}



What Is the Title of This Picture?

Solve each equation below by completing the square. Find the solution set in the answer list and notice the letter next to it. Each time the exercise number appears in the code, write this letter above it. Keep working and you will decode the title of the picture.



- ① $x^2 + 6x = 16$
- ② $a^2 + 10a = -21$
- ③ $x^2 - 8x = 33$
- ④ $n^2 - 4n = 11$
- ⑤ $b^2 + 20b = -80$
- ⑥ $x^2 - 12x = 39$
- ⑦ $m^2 - 6m - 1 = 0$
- ⑧ $t^2 - 8t - 20 = 0$
- ⑨ $x^2 + 12x + 18 = 0$
- ⑩ $y^2 + 2y - 80 = 0$
- ⑪ $x^2 - 10x - 7 = 3$
- ⑫ $k^2 + 16k + 60 = 5$
- ⑬ $x^2 - 24x + 70 = -30$
- ⑭ $y^2 + 30y - 75 = 100$

CODED TITLE:

11 12 3 14 4 12 7 13 13 8 2 13

5 10 13 8 1 5 14 2 12 6 14 13 12 1 9

Ⓑ $\{5 \pm \sqrt{35}\}$

Ⓡ $\{2, -8\}$

Ⓦ $\{6 \pm 5\sqrt{3}\}$

Ⓒ $\{2 \pm \sqrt{15}\}$

Ⓕ $\{8, -10\}$

Ⓞ $\{-5, -11\}$

Ⓢ $\{5, -35\}$

Ⓨ $\{11, -3\}$

Ⓐ $\{-10 \pm 2\sqrt{5}\}$

Ⓝ $\{-3, -7\}$

Ⓔ $\{10, -2\}$

Ⓛ $\{5 \pm 3\sqrt{10}\}$

Ⓤ $\{3 \pm \sqrt{10}\}$

Ⓣ $\{12 \pm 2\sqrt{11}\}$

Ⓜ $\{-6 \pm 3\sqrt{2}\}$

What Is a Metaphor?

Solve each equation below using the quadratic formula. Cross out the box that contains the solution set. When you finish, print the letters from the remaining boxes in the spaces at the bottom of the page.

- ① $x^2 + 4x + 3 = 0$
- ② $x^2 - 7x + 10 = 0$
- ③ $x^2 + 5x + 6 = 0$
- ④ $x^2 - 3x - 4 = 0$
- ⑤ $y^2 + 2y - 8 = 0$
- ⑥ $x^2 - 5x + 2 = 0$
- ⑦ $d^2 + 3d - 7 = 0$
- ⑧ $2x^2 - 5x + 2 = 0$
- ⑨ $2n^2 - 3n - 5 = 0$
- ⑩ $3x^2 + 5x + 1 = 0$
- ⑪ $3y^2 - 2y - 8 = 0$



ONE $\{5, 2\}$	ATH $\left\{\frac{-5 \pm \sqrt{13}}{6}\right\}$	TOK $\left\{-4, \frac{1}{2}\right\}$	ING $\left\{\frac{5}{2}, -1\right\}$	ICK $\left\{\frac{-3 \pm \sqrt{37}}{2}\right\}$
ASL $\{-2, -3\}$	EEP $\left\{\frac{3 \pm \sqrt{15}}{2}\right\}$	MET $\{2, -4\}$	BOW $\left\{2, -\frac{4}{3}\right\}$	COW $\left\{\frac{2 \pm \sqrt{30}}{6}\right\}$
BOY $\left\{2, \frac{1}{2}\right\}$	RIT $\{-1, -3\}$	SIN $\{6, 1\}$	GLE $\left\{\frac{5 \pm \sqrt{17}}{2}\right\}$	ING $\{4, -1\}$

What Do You Call It When Somebody Spends 20 Years in the 24th Row of a Theater?

Solve each equation below using the quadratic formula. Find the solution set at the bottom of the page and print the letter of the exercise above it.

Ⓘ $2x^2 - 7x + 5 = 0$

Ⓛ $x^2 - 6x + 4 = 0$

Ⓝ $2x^2 + x - 6 = 0$

Ⓛ $t^2 + 4t - 2 = 0$

Ⓢ $3n^2 - 2n - 5 = 0$

Ⓝ $3x^2 + 10x + 5 = 0$

Ⓐ $w^2 + 7w + 4 = 0$

Ⓥ $4x^2 - 3x = 1$

Ⓛ $5x^2 + 3x - 3 = 0$

Ⓛ $2d^2 + 4 = 5d$

Ⓒ $6x^2 - x = 2$

ⓧ $2x = 7 - x^2$

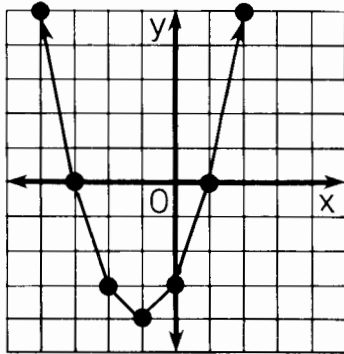
Ⓔ $2y^2 + 2 = 9y$

Ⓛ $y^2 + 9 = -9y$

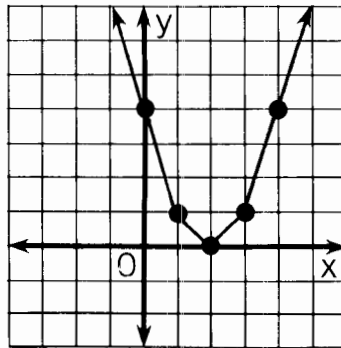
$\{-2 \pm \sqrt{6}\}$	$\left\{-\frac{3 \pm \sqrt{69}}{10}\right\}$	$\left\{1, -\frac{1}{4}\right\}$	$\{3 \pm \sqrt{5}\}$	$\left\{\frac{3}{2}, -2\right\}$	$\left\{\frac{2}{1}, \frac{3}{2}\right\}$	$\{-1 \pm 3\sqrt{5}\}$	$\left\{\frac{5}{1}, \frac{2}{1}\right\}$	$\left\{-\frac{5 \pm \sqrt{10}}{3}\right\}$	$\left\{-\frac{9 \pm \sqrt{30}}{2}\right\}$	$\{-1 \pm 2\sqrt{2}\}$	$\left\{\frac{2}{3}, -\frac{2}{2}\right\}$	$\left\{-\frac{7 \pm \sqrt{33}}{2}\right\}$	$\left\{-\frac{9 \pm 3\sqrt{5}}{2}\right\}$	$\left\{\frac{5}{3}, -1\right\}$	no solution	$\left\{\frac{9 \pm \sqrt{65}}{4}\right\}$
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How Can You Help Control Soil Erosion?

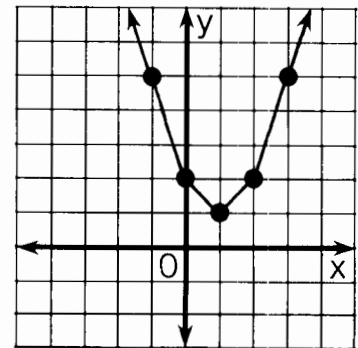
Use the related graph or the discriminant of each equation to determine how many real-number solutions it has. Circle the letter of the correct choice and write this letter in the box containing the exercise number.



- ① $x^2 + 2x - 3 = 0$
 (D) two solutions
 (E) one solution
 (M) no solutions



- ② $x^2 - 4x + 4 = 0$
 (C) two solutions
 (A) one solution
 (W) no solutions



- ③ $x^2 - 2x + 2 = 0$
 (H) two solutions
 (D) one solution
 (O) no solutions

	two solutions	one solution	no solutions								
④ $x^2 + 5x + 4 = 0$	K	B	G								
⑤ $x^2 - 3x = 2$	U	O	A								
⑥ $y^2 + 10y + 25 = 0$	V	A	I								
⑦ $2x^2 = 4x - 3$	F	C	H								
⑧ $4x^2 + 9 = 12x$	S	P	N								
⑨ $-3n^2 + 5n - 2 = 0$	N	R	S								
⑩ $\frac{1}{2}x^2 + 3x + 8 = 0$	R	P	L								
⑪ $\frac{1}{3}t^2 + 3 = 2t$	Y	B	T								
	7	3	10	1	5	8	2	11	6	9	4

OBJECTIVE 4-f: To use the related graph or the discriminant of a equation to determine how many real-number solutions it has.

Did You Hear About...

A	B	C	D
E	F	G	H
			?

Solve each problem below. If an irrational root occurs, round to the nearest tenth. Find your answer in the answer column and notice the word next to it. Write this word in the box containing the letter of the exercise. Keep working and you will hear about a joint joint.

- (A) The length of a rectangle is 4 m more than the width. The area of the rectangle is 45 m^2 . Find the length and width.
- (B) The length of a rectangle is three times the width. The area is 108 cm^2 . Find the dimensions of the rectangle.
- (C) The length of a photograph is 1 cm less than twice the width. The area is 28 cm^2 . Find the dimensions of the photograph.
- (D) A square field had 3 m added to its length and 2 m added to its width. The field then had an area of 90 m^2 . Find the length of a side of the original field.
- (E) The length of a rectangular mural is 2 m greater than the width. The area is 20 m^2 . Find the dimensions of the mural.
- (F) The length of a rectangle is 6 cm more than the width. The area is 11 cm^2 . Find the length and width.
- (G) The length of a rectangular garden is 4 m greater than the width. The area is 71 m^2 . Find the dimensions of the garden.
- (H) The length of a rectangular park is 2 km less than twice the width. The area is 9 km^2 . Find the dimensions of the park.

2 cm by 14 cm	JOINT
4 cm by 7 cm	WHO
2.1 km by 4.3 km	BONES
3.6 m by 5.6 m	NOTHING
1.8 cm by 7.8 cm	MORE
8 m	WAS
5 m by 9 m	THE
2.7 km by 3.4 km	TALK
7 m	GOT
5.2 m by 9.2 m	SORE
1.5 cm by 7.5 cm	BUT
6 cm by 18 cm	CHIROPRACTOR
3.3 cm by 5.3 cm	EVERYBODY
6.7 cm by 10.7 cm	BACK
5 cm by 15 cm	BROKEN

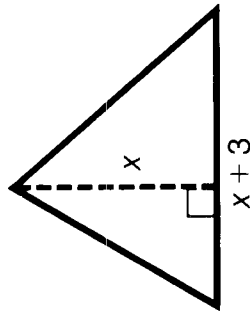




nce upon a time a mother skunk had two baby skunks, named In and Out. When Out was in, In was out. One day, In went out and Out came in, and the mother skunk sent Out out to bring In in. How did Out find In?

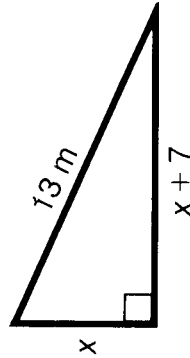
Solve each problem below. If an irrational root occurs, round to the nearest tenth. Find your answer at the bottom of the page and cross out the letter above it. When you finish, the answer to the title question will remain.

- ① The base of a triangle is 3 cm longer than its altitude. The area of the triangle is 35 cm^2 . Find the altitude. (Hint: The area of a triangle equals $\frac{1}{2} \cdot \text{base} \cdot \text{altitude}$.)



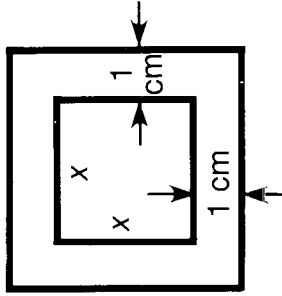
- ② The altitude of a triangle is 2 cm shorter than its base. The area is 15 cm^2 . Find the base of the triangle.

- ③ A flower garden is in the shape of a right triangle. The longest side of the triangle measures 13 m. One of the shorter sides is 7 m longer than the other. Find the length of the shortest side. (Hint: Use the Pythagorean Theorem: $a^2 + b^2 = c^2$.)



- ④ The diagonal measure of a movie screen is 6 m. The length of the screen is 2 m greater than the height. Find the dimensions of the screen.

- ⑤ A square picture is mounted in a frame 1 cm wide. The area of the picture is $\frac{2}{3}$ of the total area. Find the length of a side of the picture.



- ⑥ A rectangular pond measures 3 m by 5 m. A concrete walk of uniform width is constructed around the pond. If the walk and pond together cover an area of 39 m^2 , how wide is the walk?

- ⑦ A rectangular counter is covered with 600 square tiles. The counter could have been covered with 400 tiles 1 cm longer on a side. Find the length of a side of the smaller tile.

O	I	T	N	S	A	T	H	I	N	O	W	C	U	T
1.2 m	4.8 cm	6.6 cm	8.2 cm	1.8 m	4.4 cm	4 m	3.1 m by 5.1 m	8 cm	7.7 cm	8.9 cm	7 cm	3.7 m by 5.7 m	5 m	5.6 cm

Why Was the Mural Painter in the News?

Solve each formula below for the indicated letter. Assume that all variables represent nonnegative numbers. CIRCLE the letter next to the correct answer. Write this letter in the box at the bottom of the page that contains the number of that exercise.

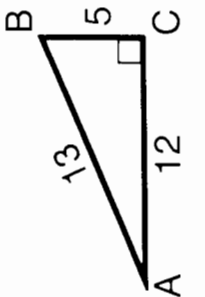
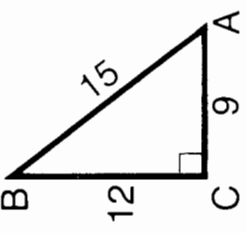
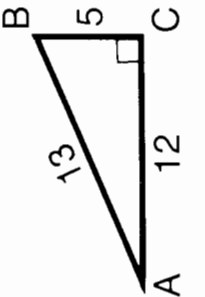
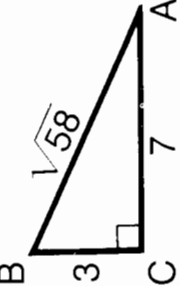
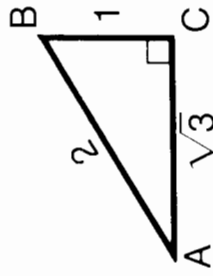
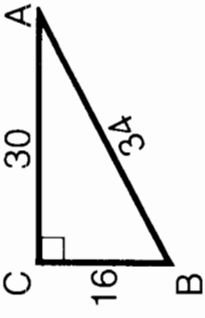
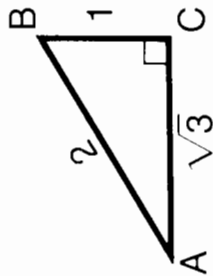
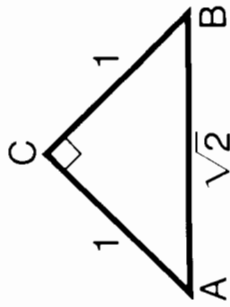
$A = s^2; s$ (E) $s = \sqrt{A}$ ① (R) $s = 2A$	$r = \sqrt{\frac{A}{\pi}}; A$ (O) $A = 2\pi r$ ⑤ (U) $A = \pi r^2$	$s = \frac{at^2}{2}; t$ (L) $t = 2\sqrt{sa}$ ⑨ (D) $t = \sqrt{\frac{2s}{a}}$	$v = \sqrt{\frac{Fr}{m}}; F$ (P) $F = \frac{mv^2}{r}$ ⑬ (R) $F = \frac{mr}{v^2}$	$c = \sqrt{a^2 + b^2}; a$ (U) $a = \sqrt{c + b^2}$ ⑰ (I) $a = \sqrt{c^2 - b^2}$
$E = mc^2; c$ (P) $c = \sqrt{Em}$ ② (N) $c = \sqrt{\frac{E}{m}}$	$I = \sqrt{\frac{P}{R}}; P$ (G) $P = IR^2$ ⑥ (C) $P = I^2R$	$k = \frac{1}{2}mv^2; v$ (H) $v = \sqrt{\frac{2k}{m}}$ ⑩ (B) $v = \sqrt{\frac{2m}{k}}$	$d = \sqrt{\frac{4A}{\pi}}; A$ (I) $A = \frac{\pi d^2}{4}$ ⑭ (U) $A = 2\pi d^2$	$a = \sqrt{x^2 + y^2}; y$ (B) $y = \sqrt{a^2 - x^2}$ ⑱ (S) $y = \sqrt{(a+x)^2}$
$s = 16t^2; t$ (M) $t = \sqrt{8}$ ③ (C) $t = \frac{\sqrt{s}}{4}$	$I = \sqrt{\frac{P}{R}}; R$ (A) $R = PI^2$ ⑦ (E) $R = \frac{P}{I^2}$	$V = \frac{\pi r^2 h}{3}; r$ (L) $r = \sqrt{\frac{3V}{\pi h}}$ ⑪ (F) $r = \sqrt{3\pi Vh}$	$h = 3\sqrt{2k}; k$ (A) $k = \frac{h^2}{18}$ ⑮ (I) $k = 9h^2$	$r = \frac{1}{2}\sqrt{\frac{S}{\pi}}; S$ (F) $S = \frac{\pi r^2}{2}$ ⑲ (M) $S = 4\pi r^2$
$V = \pi r^2 h; r$ (A) $r = \sqrt{\frac{V}{\pi h}}$ ④ (L) $r = \sqrt{\frac{Vh}{\pi}}$	$w = \sqrt{\frac{V}{h}}; h$ (N) $h = \frac{V}{w^2}$ ⑧ (T) $h = \frac{w}{V}$	$s = \frac{kbd^2}{\ell}; d$ (T) $d = \sqrt{\frac{ks}{\ell b}}$ ⑫ (E) $d = \sqrt{\frac{\ell s}{kb}}$	$T = 2\pi\sqrt{\frac{\ell}{g}}; \ell$ (T) $\ell = 4\pi gT^2$ ⑯ (S) $\ell = \frac{gT^2}{4\pi^2}$	$F = \frac{km_1m_2}{d^2}; d$ (E) $d = \sqrt{\frac{km_1m_2}{F}}$ ⑳ (I) $d = \sqrt{Fkm_1m_2}$

10	7	19	15	9	1	4	16	6	20	2	12	17	8	13	5	18	11	14	3
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What Did Mrs. Margarine Think About Her Sister's Husband?

For each exercise, select the correct ratio from the four choices given. Write the letter of the correct choice in the box that contains the number of that exercise.

<p>① $\sin A$</p> <p>② $\cos A$</p> <p>③ $\tan A$</p>	<p>① $\frac{12}{13}$</p> <p>② $\frac{5}{13}$</p> <p>③ $\frac{13}{5}$</p> <p>④ $\frac{5}{12}$</p> <p>⑤ $\frac{13}{12}$</p> <p>⑥ $\frac{12}{5}$</p>		<p>⑬ $\sin A$</p> <p>⑭ $\cos A$</p> <p>⑮ $\tan A$</p>	<p>① $\frac{5}{3}$</p> <p>② $\frac{4}{3}$</p> <p>③ $\frac{3}{5}$</p> <p>④ $\frac{4}{5}$</p>	
<p>④ $\sin B$</p> <p>⑤ $\cos B$</p> <p>⑥ $\tan B$</p>	<p>① $\frac{13}{5}$</p> <p>② $\frac{5}{13}$</p> <p>③ $\frac{12}{5}$</p> <p>④ $\frac{12}{13}$</p>		<p>⑯ $\sin B$</p> <p>⑰ $\cos B$</p> <p>⑱ $\tan B$</p>	<p>① $\frac{3}{\sqrt{58}}$</p> <p>② $\frac{7}{\sqrt{58}}$</p> <p>③ $\frac{3}{7}$</p> <p>④ $\frac{7}{3}$</p>	
<p>⑦ $\sin A$</p> <p>⑧ $\cos A$</p> <p>⑨ $\tan A$</p>	<p>① $\frac{\sqrt{3}}{2}$</p> <p>② 2</p> <p>③ $\frac{1}{2}$</p> <p>④ $\frac{1}{\sqrt{3}}$</p>		<p>⑲ $\sin A$</p> <p>⑳ $\cos A$</p> <p>㉑ $\tan A$</p>	<p>① $\frac{15}{17}$</p> <p>② $\frac{17}{8}$</p> <p>③ $\frac{8}{17}$</p> <p>④ $\frac{8}{15}$</p>	
<p>⑩ $\sin B$</p> <p>⑪ $\cos B$</p> <p>⑫ $\tan B$</p>	<p>① $\sqrt{3}$</p> <p>② $\frac{\sqrt{3}}{2}$</p> <p>③ $\frac{1}{2}$</p> <p>④ $\frac{1}{\sqrt{3}}$</p>		<p>㉒ $\sin A$</p> <p>㉓ $\cos A$</p> <p>㉔ $\tan A$</p>	<p>① $\frac{1}{\sqrt{2}}$</p> <p>② 1</p> <p>③ $\frac{1}{\sqrt{2}}$</p> <p>④ $\sqrt{2}$</p>	

14	3	17	6	10	23	8	1	20	12	15	7	19	24	11	5	22	13	9	2	16	21	4	18
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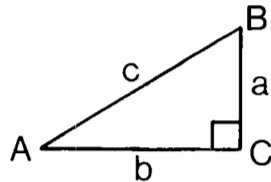
What Did the Prince Do Whenever He Found a Girl Who Might Be Cinderella?

Use the table of trigonometric ratios to do each exercise. Find each answer at the bottom of the page and write the letter of the exercise above it.

Find the following:

- (T) $\sin 25^\circ$ (H) $\tan 35^\circ$ (E) $\cos 10^\circ$ (E) $\cos 80^\circ$ (O) $\sin 70^\circ$ (A) $\tan 45^\circ$

Use the figure at the right for the remaining exercises.



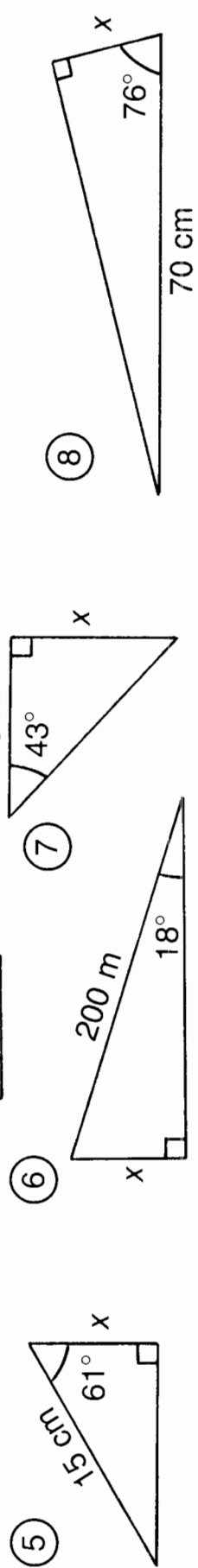
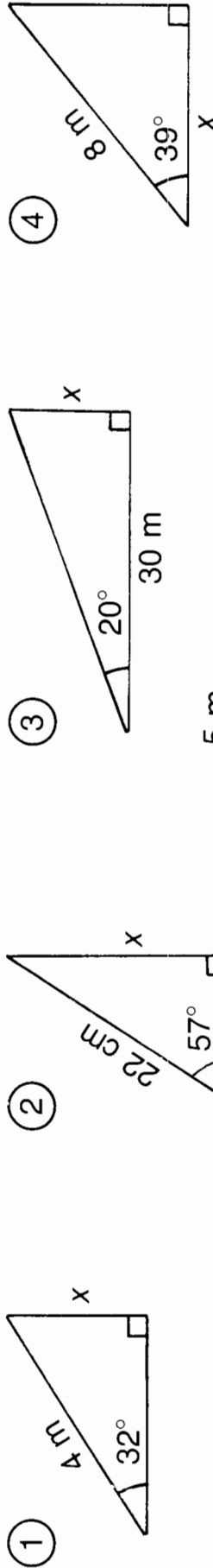
- (W) If $m\angle A = 20^\circ$, then $\frac{a}{c} =$
- (O) If $\frac{a}{c} = 0.5736$, then $m\angle A =$
- (E) If $m\angle A = 75^\circ$, then $\frac{b}{c} =$
- (N) If $\frac{b}{c} = 0.5000$, then $m\angle A =$
- (E) If $m\angle A = 55^\circ$, then $\frac{a}{b} =$
- (T) If $\frac{a}{b} = 0.8391$, then $m\angle A =$
- (D) If $m\angle B = 5^\circ$, then $\frac{a}{c} =$
- (W) If $\frac{a}{c} = 0.4226$, then $m\angle B =$
- (T) If $m\angle B = 30^\circ$, then $\frac{b}{a} =$
- (N) If $\frac{b}{a} = 5.6713$, then $m\angle B =$
- (F) If $m\angle B = 50^\circ$, then $\frac{b}{c} =$
- (D) If $\frac{b}{c} = 0.2588$, then $m\angle B =$

Angle	Sin	Cos	Tan
0°	0.0000	1.0000	0.0000
5°	.0872	.9962	.0875
10°	.1736	.9848	.1763
15°	.2588	.9659	.2679
20°	.3420	.9397	.3640
25°	.4226	.9063	.4663
30°	.5000	.8660	.5774
35°	.5736	.8192	.7002
40°	.6428	.7660	.8391
45°	.7071	.7071	1.0000
50°	.7660	.6428	1.1918
55°	.8192	.5736	1.4281
60°	.8660	.5000	1.7321
65°	.9063	.4226	2.1445
70°	.9397	.3420	2.7475
75°	.9659	.2588	3.7321
80°	.9848	.1736	5.6713
85°	.9962	.0872	11.4301
90°	1.0000	.0000	-----

0.7002 0.2588 65° 0.9848 80° 0.4226 15° 0.9397 0.3420 60° 0.5774 35° 0.9962 0.1736 0.7660 1.4281 1.0000 40°

What Do They Call the Big Grass Field on an Orbiting Satellite?

For the first eight exercises, find the length x . For the remaining exercises, find the length needed to solve the problem. Round each answer to the nearest tenth. Cross out each box that contains a correct answer. When you finish, write the letters from the remaining boxes in the spaces at the bottom of the page.



- ⑨ At a point 20 meters from a flagpole, the angle of elevation of the top of the flagpole is 48° . How tall is the flagpole?
-
- ⑩ If a rocket flies 2° off course for 1000 miles, how far from the correct path will the rocket be?
-
- ⑪ As it leans against a building, a 9-meter ladder makes an angle of 55° with the ground. How far is the bottom of the ladder from the base of the building?
-

TH	AP	ET	E	AR	UN	A	KI	SS
4.7 m	5.4 m	5.2 m	2.1 m	23.5 m	6.2 m	22.2 m	28.7 mi	61.8 m
RU	NS	TO	P	UP	A	KY	NI	CE
18.5 cm	3.2 m	7.3 cm	63.6 m	34.9 mi	15.3 cm	10.9 m	16.9 cm	17.1 cm

● DAFFYNYTION DECODER ●

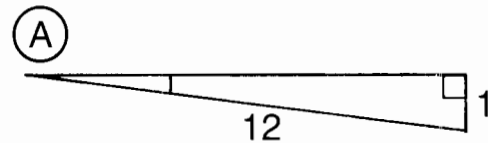
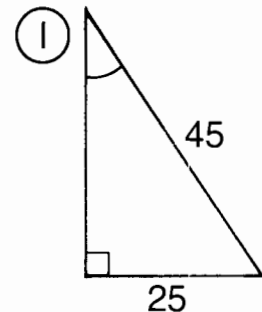
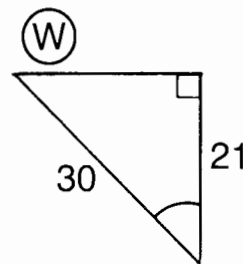
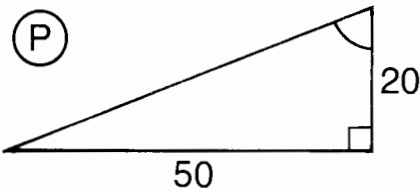
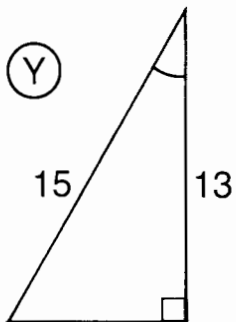
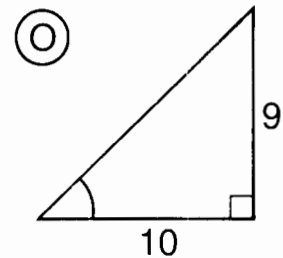
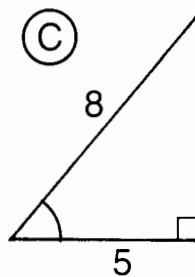
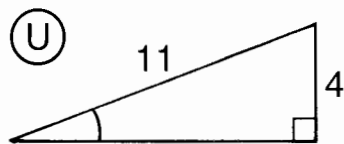
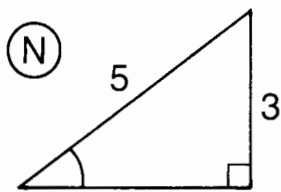
EUROPE:

30°	42°	21°	24°	74°	2°	21°	24°	37°	49°	2°	42°	17°	32°	5°	2°
-----	-----	-----	-----	-----	----	-----	-----	-----	-----	----	-----	-----	-----	----	----

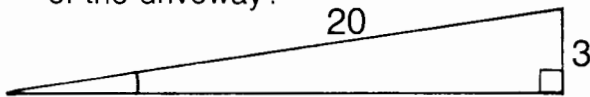
UNDERGROUND GARAGE:

46°	5°	9°	9°	28°	2°	42°	7°	46°	5°	9°	9°	7°	51°	5°	24°	68°	34°	2°
-----	----	----	----	-----	----	-----	----	-----	----	----	----	----	-----	----	-----	-----	-----	----

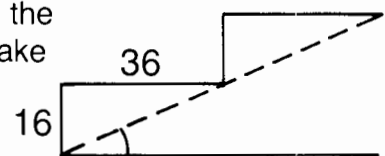
TO DECODE THE TWO DAFFYNYTIONS ABOVE: For the first nine exercises, find the measure of the angle indicated. For the remaining exercises, find the angle measure needed to solve the problem. Round to the nearest degree. Each time the answer appears in the code, write the letter of the exercise below it.



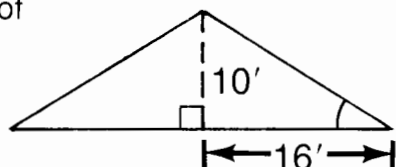
- (L) A driveway is built on an incline so that it rises 3 m over a distance of 20 m. What is the angle of elevation of the driveway?



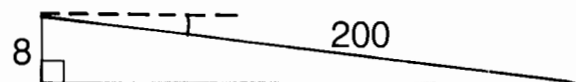
- (R) Each step of a stairway rises 16 cm for a tread width of 36 cm. What angle does the stairway make with the floor?



- (B) A roof is constructed as shown in the diagram. Find the pitch (angle of elevation) of the roof.



- (T) A train decreases its altitude by 8 m when traveling along 200 m of track. Find the angle of depression of the track.



When Should You Use the Fact That

$$(a + b)^4 = a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4?$$

For each exercise, find a word (or words) that has the given meaning and also fits in the adjacent set of boxes. Fill in the boxes and then notice which letters are in numbered boxes. Write each of these letters in the matching numbered box at the bottom of the page.

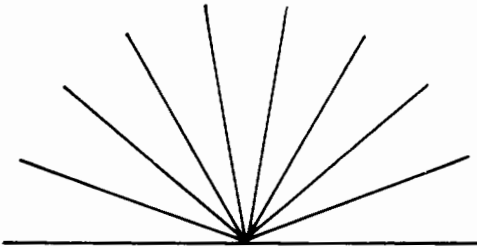
- ① A set of two elements in which the order is specified.
 9
- ② Two perpendicular number lines, or axes, used for graphing ordered pairs of numbers. 5 22
- ③ An ordered pair that satisfies an equation (or inequality) in two variables. 16
- ④ The set of all points whose coordinates satisfy an equation (or inequality). 12
- ⑤ The steepness of a line as defined by the ratio: $\frac{\text{difference of y-coordinates}}{\text{difference of x-coordinates}}$ 20
- ⑥ The y-coordinate of a point where a graph intersects the y-axis. - 2
- ⑦ The form of a linear equation $y = mx + b$, where m is the slope and b is the y-intercept. 13 - 1
- ⑧ A set of equations in the same variables. 4 11
- ⑨ A set of ordered pairs in which no two ordered pairs have the same first element. 6
- ⑩ A function defined by an equation of the form $y = kx$, where k is a nonzero constant. 14 19
- ⑪ A function defined by an equation of the form $y = \frac{k}{x}$, where k is a nonzero constant. 7 21
- ⑫ An expression of the form \sqrt{a} . 10
- ⑬ If $ax^2 + bx + c = 0$, $a \neq 0$, then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. 15 18 3
- ⑭ The graph of a quadratic function. 8 17

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----

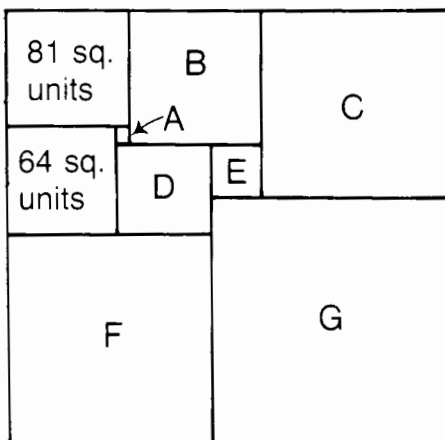
TEST OF GENIUS

- ① Each of Bork's bags contains the same number of marbles. He has twice as many bags as he has marbles in each bag. If he has 32 marbles in all, how many are in each bag?

- ② How many angles (less than 180°) are in the figure below?



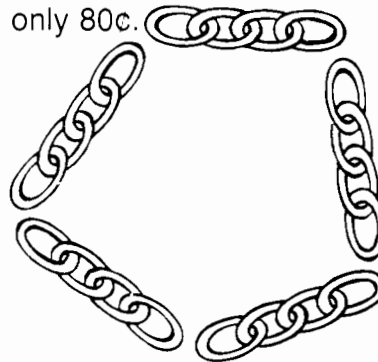
- ③ The rectangle below is divided into square regions. Using the information given, find the area of each of these regions. Is the outside rectangle a square also?



- ④ Show that two WRONG's can make a RIGHT. Replace each different letter in the addition below with a different digit. It is required that $O = \text{zero}$.

$$\begin{array}{r} \text{WRONG} \\ + \text{WRONG} \\ \hline \text{RIGHT} \end{array}$$

- ⑤ Jennifer's brother Matthew has one more brother than he has sisters. How many more brothers than sisters does Jennifer have?
- ⑥ Rolex has five pieces of chain, each containing four links. He wants to join the pieces to form a circle. If it costs 10¢ to open a link, and 10¢ to close a link, find a way he can do this for only 80¢.



- ⑦ A, B, and C decide to play poker. They agree that when a player loses a hand, he will pay each of the others an amount equal to the amount each player already has. A loses the first hand and pays B and C the amount of money each has; B loses the second hand and pays A and C the amount of money each has; C loses the third hand and pays A and B the amount of money each has. At this point, each player has \$8. How much did each player start with?
- ⑧ Leather shoes are worn in bowling and rubber-soled sneakers in tennis. In what sport are all-metal shoes worn?

SCORING KEY

- 7 or 8 — *Foremost Genius*
 5 or 6 — *Fabulous Genius*
 3 or 4 — *Frequent Genius*
 1 or 2 — *Future Genius*

SOLUTIONS

Page 1

1. A TUNNEL WITH LEAKS
2. A BIG ELECTRIC BILL

H. 60
A. 20
W. 7
S. 26
E. 62
U. 22
B. 100
G. 8
R. 5
T. 0
K. 24
N. 81
C. 90
I. 32
L. 1

Page 2

I. 37
T. 76
U. 28
O. 33
E. 26
G. 31
A. 12
T. 62
Y. 83
I. 53
O. 27
R. 0
I. 27
C. 49
H. 3
O. 64
M. 62
V. 16
P. 7
G. 17
K. 140
H. 12
P. 10

IT MIGHT GIVE YOU A PORK CHOP
It might give you a pork chop.

Page 3

E. 35
I. 51
A. 70
Y. 18
T. 43
E. 7
P. 19
A. 6
O. 60
T. 16
H. 20
E. 1
D. 41
W. 24

K. 11
N. 72
L. 8
U. 30
W. 10
O. 0

HE WANTED TO WAKE UP OILY
He wanted to wake up oily (early).

Page 4

1. T
2. I
3. S
4. A
5. I
6. E
7. N
8. T
9. A
10. N
11. I
12. O
13. U
14. T
15. H
16. S
17. T
18. N

IN A TENTHS SITUATION
In a tenths (tense) situation

Page 5

A. 7b
R. 4x
Y. 27
S. 24x
O. 4a
E. xy
I. 8y
D. 30x
W. ax
E. 2ay
T. 5
R. 6y
O. y
T. a
W. 4
H. 3
E. x
A. u
F. m
M. 3/4
S. 2y
T. k
R. 3a

THEY ARE MADE FOR TWO WRISTS
They are made for two wrists (tourists).

Page 6

E. $8x \cdot 9$
S. $3x + 11$
O. $9x + 8$
L. $11x - 9$
A. $6x$
F. $10x - 8$
E. $7x + 7$
O. $9t + 4u$
A. $8t + 12u + 4$
I. $9t + 6u + 7$
P. $7t + 13u$
E. $4t - 8u + 4$
M. $16t + 4u$
F. $8t + u + 13$
L. $8x + 5y - 7$
E. $8x + 9y - 9$
D. $12x - 15y$
O. $10x + 7y + 13$
M. $9y + 8$
H. $12x + 17y$
T. $x + 6y$
E. $n + 4w$
M. $n + 18w + 3$
O. $3n + 10w + 12$
C. $16n + 5w$
H. $n + 10w + 6$
L. $11n + 7w + 2$
P. $7n + 2w$

HE MADE A COMPLETE POOL OF HIMSELF
(fool of himself)

Page 7

1. $19x + 18$
2. $21x + 22$
3. $20x + 29$
4. $3x + 36$
5. $29x + 6$
6. $25x + 42$
7. $13x + 30$
8. $42x + 46$
9. $20x + 53$
10. $12m + 22$
11. $13m + 49$
12. $10m + 10$
13. $15m + 35$
14. $23m + 33$
15. $19m + 54$
16. $43m + 24$
17. $39m + 73$
18. $66m + 18$

OH LAY Oh lay (olé).

Page 8

THE CLEVER COUPLE WHO GAVE THEIR BABY DAUGHTER THE NAME MARGARINE BECAUSE THEY DIDN'T HAVE ANY BUT HER

A. 81
B. 500
C. 18
D. 36
E. 150
F. 900
G. 64
H. 54
I. 48
J. 7
K. 343
L. 144
M. 324
N. 1000
O. 32
P. 360
Q. 225
R. 242

Page 9

You may wish to have students show on a separate paper how they substitute the given value for each variable and determine if it is a solution.

1. P
2. A
3. A
4. R
5. I
6. N
7. N
8. E
9. T
10. D
11. I
12. N
13. G
14. E
15. A
16. S
17. I
18. S
19. E
20. L
21. L
22. E
23. Y

PAINTING IS LEARNED EASELY
Painting is learned easily (easily).

Page 10

E. 3
O. 18
S. 25
R. 19
A. 5
I. 12
N. 15
A. 9

S. 1
G. 16
N. 24
O. 27
I. 14
R. 8
S. 6
A. 20
H. 2
O. 22
C. 13
T. 11
W. 4
T. 28
F. 17
P. 7
O. 23
C. 10
H. 26
M. 21

SHE WAS PRACTICING FOR A MOON SHOT
She was practicing for a moon shot.

Page 11

You may wish to have students write an equation for each exercise, such as $-5 + -3 = -8$.
U. -8
E. 4
H. 3
A. -20
I. -7
E. -11
S. 20
T. -45
E. 7
R. -13
B. -2
S. 0

HE IS A SURE BET
He is a sure bet (sherbet).

Page 12

- 1. -8
- 2. 4
- 3. -3
- 4. 9
- 5. -11
- 6. 7
- 7. 12
- 8. -8
- 9. -3
- 10. 1
- 11. -8
- 12. 4
- 13. -3
- 14. -15
- 15. 6
- 16. 20
- 17. -5
- 18. -3
- 19. -8
- 20. -2
- 21. 4
- 22. 7
- 23. 0
- 24. -3
- 25. 7
- 26. -15
- 27. -15
- 28. -3
- 29. 7
- 30. 16

THEY WANTED THE PRIZE TO HAVE APPEAL

They wanted the prize to have appeal (a peel).

Page 13

- W. 14
 - A. 11
 - N. -7
 - D. -16
 - O. -6
 - N. 17
 - E. 3
 - U. -9
 - G. 10
 - N. -2
 - T. 7
 - O. 33
 - R. 15
 - N. 0
 - R. 22
- ONE WRONG TURN AND
- I. -5
 - O. -6
 - E. 9
 - R. 19
 - E. 8
 - O. 3
 - A. -1
 - Y. 12
 - R. -20
 - U. -11
 - N. 7
 - T. 17

- H. -10
 - W. -4
 - T. -24
- YOU'RE IN HOT WATER

Page 14

- 1. -2
- 2. -37
- 3. 23
- 4. -41
- 5. 14
- 6. -662
- 7. 179
- 8. -282
- 9. -4
- 10. 0
- 11. -5822
- 12. -34 yd
- 13. \$192.75
- 14. \$40,200
- 15. -286 m
- 16. 17

A BAD GOLFER

Page 15

- Y. -12
- E. 40
- O. -63
- R. 48
- O. -48
- E. -40
- S. 12
- E. -64
- N. -100
- V. 100
- L. -24
- O. 24
- U. -60
- D. 60
- U. -27
- O. -120
- W. 360
- S. -165
- T. 120
- H. 0

SO EVERYONE WOULD SHOUT

- E. -2400
- T. 1600
- O. -720
- T. -64
- A. -96
- H. 84
- L. 150
- S. 64
- O. -84
- K. -1600
- A. 600
- O. -600
- R. -720
- C. 800
- G. 720

LOOK AT THE S CAR GO

So everyone would

shout: Look at the S car go (escargot).

Page 16

UNASSEMBLED SANDPAPER

- D. -80
 - U. 189
 - E. -480
 - B. -360
 - A. 144
 - R. -125
 - L. -216
 - N. 64
 - M. -72
 - P. 10,000
 - S. 1500
- DOORKNOB WEARING BIKINI
- E. -120
 - G. 81
 - O. 130,000
 - A. -32
 - K. -900
 - W. -729
 - B. 288
 - D. -400
 - I. 400
 - R. -648
 - N. 98

Page 17

JUST BEFORE THE SET CAVED IN

- H. -6
- A. -60
- O. 14
- S. 24
- I. -20
- R. 66
- D. -7
- J. -64
- C. -22
- B. 10
- N. -5
- T. 4
- U. -61
- E. -1
- F. 2
- V. 0

IT ALWAYS GETS PUSHED AROUND

- U. 7
- Y. -24
- E. -18
- I. 16
- D. -26
- L. -4
- O. 250
- H. 21
- T. -2
- W. 400
- N. -54
- G. -8
- R. 15
- S. -28
- P. 50
- A. -9

T. -9

Page 18

- E. -11
- A. 5
- H. -9
- T. 2
- E. 22
- B. 9
- A. -18
- I. -5
- E. -30
- N. 17
- R. 13
- E. -21
- A. 28
- D. 10
- S. 0
- E. -8
- I. 15
- H. -32
- E. -1
- S. 35
- T. -10
- B. -6
- M. -14
- E. 12
- G. -2
- B. -24
- T. 19
- G. -3
- C. -20
- X. 25
- L. 4
- M. 7
- Y. 11

HE BECAME THE BIGGEST LAMB DYER IN TEXAS

He became the biggest lamb dyer in Texas

Page 19

- 1. -5
- 2. -10
- 3. 12
- 4. -6
- 5. 20
- 6. -7
- 7. -10
- 8. -19
- 9. 4
- 10. -5
- 11. -10
- 12. 9
- 13. 2
- 14. -8
- 15. -1
- 16. 9
- 17. -7
- 18. 2
- 19. 4
- 20. -17
- 21. 0
- 22. -10
- 23. 2
- 24. -12
- 25. 9

26. -6

27. -12

28. 4

29. -3

30. -68

IT WASNT QUITE OLD ENOUGH TO BE A BUCK

It wasn't quite old enough to be a buck.

Page 20

- S. -25
- U. 4
- E. -20
- M. 26
- E. 9
- U. -49
- L. 210
- E. 16
- N. -72
- D. -4
- W. -530
- R. 6
- R. -17
- O. -29
- A. -9
- L. 900
- N. -36
- F. 8
- S. -10
- E. -81
- H. -96
- T. 18
- N. -11
- O. 2
- E. 140
- U. -15
- Y. -1
- Y. -64
- S. 20
- N. -5
- R. -40
- O. -60

WHEN YOUR NOSE RUNS AND YOUR FEET SMELL

Page 21

A WOODEN
PANCAKE
LOOKING AT MILK
WIZARD OF GAUZE

- D. -34
E. -17
F. -54
I. 49
R. -5
A. -22
P. 13
L. 336
T. -29
U. -360
G. -12
M. 18
Z. -45
K. 1328
C. -144
O. -2
N. 25
W. 11

Page 22

1. $6x$
2. $-8y$
3. $-5x$
4. $11y$
5. $-9x$
6. $16y$
7. $9x$
8. $5y + 4$
9. $-3x + 7$
10. $-6y - 4$
11. $10x - 6$
12. $8x - 3y$
13. $6x + y - 3$
14. $-x - 2y + 7$
15. $6x + 7y + 9$
16. $x - y - 12$
17. $5x - 10y + 6$
18. $-4x + 4y - 9$
19. $-3x - 4y + 11$
20. $-3x + 4y - 7$
21. $7x - 6y + 9$

A LOWHA

a low ha (aloha)

Page 23

This puzzle is designed to encourage students to simplify the expression *before* evaluating it. You might need to help them with the directions.

1. 24
2. 17
3. -41
4. 20
5. 48
6. -58
7. -52
8. 40
9. 64

10. -12
11. -32
12. 43
13. -25
14. -16

A WRECKED
TANGLE

A wrecked tangle
(rectangle)

Page 24

1. E
2. H
3. Y
4. T
5. O
6. N
7. W
8. L
9. C
10. A
11. L
12. M
13. I
14. H
15. X
16. A
17. Y
18. R

THEY NOW CALL
HIM X RAY

They now call him x
Ray.

Page 25

1. $11x - 8$
2. $-7x + 4$
3. $3x - 21$
4. $3x - 9$
5. $17x - 38$
6. $7x - 29$
7. $-4x + 68$
8. $-40x + 23$
9. $-16x - 30$
10. $17x + 12$
11. $-23x - 32$
12. $13x + 15$
13. $4x + 27$
14. $-12x + 4$

SIGN A PARTITION

Sign a partition
(petition).

Page 26

This puzzle is designed to encourage students to simplify the expression *before* evaluating it. You might need to help them with the directions.

1. E.6
2. A.31
3. T.-41
4. A.50
5. 1.11

6. T.54
7. A.-42
8. T.-8
9. W.68
10. H.-48
11. T.49
12. C.26
13. L.24
14. C.48

WITH A CATTLE ACT

With a cattle act
(Cadillac)

Page 27

You may wish to discuss the meaning and/or derivation of some of these formulas with your students.

1. 416
2. 210
3. 47
4. 170
5. 620
6. 78.4
7. 288
8. 378

VERY RUGGED

Very rugged

Page 28

1. -11
2. 18
3. 4
4. -5
5. 24
6. -9
7. -6
8. 12
9. 22
10. 46
11. 80
12. -17
13. 39
14. -24
15. -65
16. 75
17. 27
18. -13
19. 100
20. -30

HAVE YOU SEEN
THE NEW PEN THAT
WRITES UNDER-
WATER, UPSIDE
DOWN, IN OUTER
SPACE, AND ALSO
LOTS OF OTHER
WORDS?

Page 29

He has a run track mind
(one-track).

**WHY DOES OSHGOSH JOG AROUND THE
HIGH SCHOOL TRACK 98 TIMES EVERY DAY?**

Solve each equation below. Draw a straight line connecting the dot by the equation to the dot by its solution. The line will cross a number and a letter. Put the letter in the matching numbered box at the bottom of the page.

① $x - 15 = -8$		-22
② $w - 3 = 24$		20
③ $x - 9 = -20$		7
④ $h - (-8) = 3$		62
⑤ $x - (-12) = -7$		-50
⑥ $15 = r - 6$		27
⑦ $-5 = x - (-17)$		-5
⑧ $x + 80 = 40$		35
⑨ $-16 + t = 7$		21
⑩ $x + 9 + 12 = -3$		-24
⑪ $x + 5 - 11 = -1$		16
⑫ $-24 + w + 8 = 4$		-11
⑬ $18 - 13 + n = -9$		-40
⑭ $40 = x + 6 - 28$		5
⑮ $-7 = 8 - 50 + x$		-12
⑯ $23 + h - 9 = 2$		-14
⑰ $-10 = w - 32 + 6$		-19
⑱ $x - (-75) = 25$		23

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
H	E	H	A	S	A	R	U	N	T	R	A	C	K	M	I	N	D

OBJECTIVE 4-b: To solve equations of the form $x + a = b$ (terms are added or subtracted).

ALGEBRA WITH PIZZAZZ!
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Page 30

- 12
- 9
- 8
- 15
- 33
- 36
- 44
- 14
- 27 ft
- 23
- \$580
- 11° C
- 29
- 35 m

QUESTIONABLE

Question a bull

Page 31

THE LADY WHO
SPENT TEN
THOUSAND
DOLLARS ON A FUR
COAT BECAUSE SHE

WANTED TO BE THE
MISS IN LYNX

- | | |
|----|-----|
| A. | 32 |
| B. | 55 |
| C. | -18 |
| D. | -70 |
| E. | 3 |
| F. | 7 |
| G. | -11 |
| H. | -25 |
| I. | 16 |
| J. | 27 |
| K. | -9 |
| L. | 64 |
| M. | -78 |
| N. | 36 |
| O. | 5 |
| P. | -4 |
| Q. | 6 |
| R. | -8 |
| S. | -20 |
| T. | 10 |

Page 32

- | | |
|----|---------|
| EN | 5 2/3 |
| NG | -2 1/2 |
| AL | 63 |
| BS | -180 |
| IN | 48 |
| GH | 2/5 |
| LY | -13 |
| HE | -7 |
| YS | 3/4 |
| RE | -1/10 |
| TC | 5/6 |
| JO | 90 |
| SW | 10 |
| NI | -1 2/3 |
| GI | -18 |
| LU | -3 3/10 |
- HE REALLY ENJOYS
SWINGING
NIGHTCLUBS

Page 33

- VINYL RESTING PLACE

**2. CHEEPERS BY
THE DOZEN**

- | | |
|----|---------|
| R. | -7 |
| O. | -45 |
| I. | -72 |
| B. | 4 1/4 |
| S. | -2 6/7 |
| C. | -8 1/3 |
| G. | 4 4/9 |
| A. | 18 |
| T. | -6 2/3 |
| D. | -5 1/3 |
| V. | 8 3/4 |
| H. | -7 1/2 |
| L. | -10 1/2 |
| Z. | 2 1/3 |
| Y. | -2/3 |
| N. | 2/15 |
| E. | -2/7 |
| P. | -1 1/10 |

Page 34

JIMMY D LOCK
EVA LU SHUN
PHIL T HANS

- | | |
|----|-----|
| O. | 6 |
| A. | -2 |
| S. | -6 |
| P. | -9 |
| Y. | -25 |
| I. | -13 |
| N. | 12 |
| C. | 5 |
| E. | -1 |
| K. | -4 |
| U. | 17 |
| J. | 10 |
| V. | -11 |
| M. | -7 |
| D. | 8 |
| H. | 25 |
| T. | -8 |
| L. | 72 |

Page 35

- 1/3
- 3/5
- 1 1/4
- 2 1/2
- 1 2/3
- 5 1/2
- 3/4
- 8 1/3
- 2 2/5
- 1/6
- 3 1/5
- 2 2/3
- 7 1/2
- 1/4
- 8

(HE) BURNED HIS
LIPS ON (THE)
EXHAUST PIPE

He burned his lips on
the exhaust pipe.

Page 36

- 12
- 56
- 36
- 2 1/5
- 2 1/2
- 14
- 55
- 1 2/3
- 3 3/4
- 48
- 10
- 84
- 1 3/5
- 64
- 0
- 3 1/3

HE WAS CHILLING
TWO BIRDS WITH
ONE CONE

He was chilling
(killing) two birds with
one cone (stone).

Page 37

- 15
- 21
- 60
- 36
- 3
- 96
- 35
- 11
- 22
- 12
- 76
- 320
- 72

LOOK AT THE
ORANGE MAMA LAID

Look at the orange
Mama laid
(marmalade).

Page 38

I see ivy.

Page 39

THE COMEDIAN
WHO
INCORPORATED
HIMSELF AND
BECAME A
LAUGHING STOCK

- | | |
|----|--------|
| A. | 13.5 |
| B. | 540 |
| C. | 65 |
| D. | 5/6 |
| E. | 35 |
| F. | 30 |
| G. | 83 |
| H. | 43.6 |
| I. | 13 |
| J. | 21 1/3 |

Page 40

- 4
- 3
- 10
- 2
- 5
- 8
- 1
- 7
- 3
- 6
- 2
- 4
- 9
- 40

SMA LLM EDI UMA
TLA RGE

Small medium at large

Page 41

- HE IS DECOM-
POSING
 - BUOY MEETS
GULL
 - BUSHED
- O. 7
N. 3
E. 6
T. -2
I. -4
G. 21
H. 16
D. -3
P. -5
L. 11
Y. -8
C. -9
M. 20
U. 9
B. -36
S. 10

Page 42

- E. 3
N. -6
A. 4
H. 10
E. -5
I. -8
T. 2
A. -16
Y. 7
S. -1
T. -12
F. 29
C. 1

THEY FASCINATE

They fascinate (fasten
eight).

Page 43

- 10, 40
- 36, 48
- 18, 27
- 25, 55
- 16, 47
- 81, 11
- 142

8. \$48, \$144

9. 12, 66

10. 87 min
ROLLING IN THE
ISLES

Rolling in the isles
(aisles)

Page 44

- 11, 66
- 13, 23
- 69
- 20, 159
- 33 m, 51 m
- 1.6 kg
- 35 kg, 65 kg
- 9, 45, 7
- 16, 32, 36
- \$237
- 35°, 60°, 85°

HES ALL RIGHT
NOW

He's all right now.

Page 45

- 12 cm, 36 cm
- 35 m, 40 m
- 33 cm, 45 cm
- 4 cm, 26 cm
- 30 cm, 15 cm,
31 cm
- 3 m, 11 m, 12 m
- 10 m, 6 m, 9 m
- 150 m, 150 m,
270 m

TAKE THE
SHORTEST ROOT.

Take the shortest root
(route).

Page 46

- 9 m by 27 m
- 30 cm by 36 cm
- 15 m by 23 m
- 16 cm, 21 cm,
32 cm
- 29 cm, 18 cm,
33 cm
- 36 m by 54 m

IT WAS AN ACHER
(an acre).

Page 47

- E. 22, 23
A. -15, -14
B. 15, 16, 17
O. -50, -49, -48
E. 32, 34
A. 22, 24, 26
K. -45, -43
H. 11, 13, 15, 17
O. 20, 22
T. 16, 18, 20
K. 9, 11, 13
R. 24, 25, 26

HE TOOK A BRAKE

Page 48

Students often need
extra help
understanding the
method used in
exercises K and T.

- INTENTLY
- FLUENTLY
- WICKEDLY

D. 3

E. -5

U. -1

C. 8

Y. 2

W. -7

I. -9

K. 20

T. 10

F. 90

L. 50

N. 12

Page 49

These problems are
challenging. You may
wish to use them as
class exercises.

- 13, 21, 36
- 14, 9, 29
- 32
- 31, 62
- 95
- 24, 20

THAT IS NOT TEA

That is not tea
(naughty).

Page 50

- 16, 32
 - 15, 28
 - 7, 21
 - 5, 13
 - 34, 10
 - 10, 14
 - 24, 18
 - 30, 60
- ALUNATICK

A luna tick

Page 51

- 15
- 8
- 6
- 31, 17
- 22
- 4, 20
- 3, 7, 14

HE KEPT
POPPING OUT
OF BED

Page 52

- 48 cm
- \$126
- 270
- 15 m, 53 m
- 5, 7, 9
- 3, 14

7. 75, 120

8. 34 cm

9. 12

10. -6, -5

11. 40 cm

MINDING THEIR
MANORS

Minding their manors
(manners)

Page 53

S. -44

N. 16

I. -66

S. -1000

L. 250

E. 12

A. 18

S. -8

T. -720

E. 4900

I. -20

S. -1

A. -50

S. 360

H. -36

R. -125

Y. -48

G. 3

I. -144

E. 999

W. -2

K. -14

T. 33

R. 1

SHE IS ALWAYS
STRIKING TREES

She is always striking
trees.

Page 54

THE FROG WHO
MOVED TO PARIS
JUST SO HE COULD
ORDER A
HAMBURGER WITH
FRENCH FLIES

A. 2/3

B. -4/5

C. 1 1/2

D. 3 1/5

E. -1 1/3

F. 2 2/9

G. -4 1/2

H. 6

I. 1/7

J. 2 3/4

K. -1 3/5

L. 1 5/6

M. -4

N. -3 1/3

O. -1/8

P. 0

Page 55

1. -1 2/5

2. 2/3

3. 18

4. -88

5. 15

6. -8

7. 3 1/2

8. -6 2/3

9. -84

10. 1/3

11. -2 3/4

12. 30

13. 1 5/6

14. -10 1/2

15. 35

16. -1

YOU CANT HAVE

YOUR KAYAK AND

HEAT IT TOO

You can't have your

kayak (cake) and heat

(eat) it, too.

Page 56

1. 2

2. -15

3. 4

4. 9

5. -6

6. -3

7. 12

8. -1

9. -5

10. 16

11. -8

12. 7

13. 0

IT IS TACKS FREE

It is tacks free (tax
free).

Page 57

1. 9, 63

2. 16, 27

3. 64

4. 60, 160

5. 112 cm, 88 cm

6. \$7320

7. 21, 168, 18

8. 12, 72, 77

9. 17 km

10. 27, 20, 40

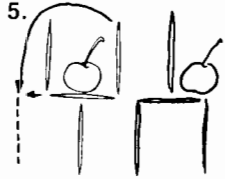
HE GOT BUCK

TEETH.

Page 58

You may prefer to use these questions one at a time.

- Jerry, Barry, Terry
- 20 pounds
- 64
- 7



- 39°
- 288
 $\frac{x \cdot 2}{576}$
- 40 chickens,
30 pigs

Page 59

- E
- N
- S
- T
- E
- U
- R
- E
- I
- T
- H
- U
- F
- T
- T
- N

IN THE FUTURE
TENTS

In the future tents
(tense)

Page 60

- L
- A
- S
- E
- D
- U
- M
- C
- H
- T
- B
- V
- O
- R

SO HE COULD
BECOME A TRAVEL
BURRO

So he could become a
travel burro (bureau)

Page 61

You may wish to have students write exercises T–S in vertical format.

- T. $7x - 8$
I. $8x - 11$
O. $9x^2 - 2x + 8$
S. $x^2 - 6x + 3$
N. $9x^2 + 8x + 7$
U. $5x^2 - 3x - 11$
I. $9x^3 - 8x^2 - 4x$
T. $4x^3 + 5x^2 + 5x - 11$
O. $x^2 + 3x + 8$
S. $-4x^4 - 2x^2 - 10$
N. $-4x^4 - 6x^3 - 6x - 1$
J. $5x^2 - 5xy - 3y^2$
A. $8x^2y + 6xy^2$
T. $3x^3y - 6x^2y^2 + xy^3$

ITS JUST A NOTION

It's just an ocean.

Page 62

- AN ITALIAN
INSECT
- A HAPPY
CONTAINER
- L
- H
- E
- R
- C
- Y
- O
- I
- P
- S
- A
- T
- N

Page 63

For the puzzles on pages 63–66 encourage students to write each answer BEFORE trying to locate it in the answer column.

- E. x^7
O. $3x^3$
T. $6x^3$
I. x^6
A. $-3x^6$
H. $4x^3$
E. x^9
R. a^3b^3
A. $6a^4b^2$
G. $-4a^2b^4$
E. $5a^6b^4$
T. $-4a^4b^4$
N. $-12a^3b^7$
O. $12a^2b^8$
T. $6u^3v^3$
E. u^4v^4
I. $-8u^6v^4$
A. $6u^9v^3$
L. $6u^7v^7$
G. $8u^6v^2$
V. u^3v^7
L. $9a^2b^5$

- Y. $-9a^2bc^3$
E. $-a^3b^3c^3$
O. $9a^2b^2c^2$
T. $-a^3b^5c^2$
H. $9a^3b^3c^5$
N. $-ab^3c^2$

THEY ARE GOING
TO HAVE A
LITTLE ONE

Page 64

- H
- E
- G
- E
- T
- S
- S
- P
- L
- I
- N
- T
- E
- R
- S
- I
- N
- H
- I
- S
- T
- O
- N
- G
- U
- E

HE GETS
SPLINTERS IN
HIS TONGUE

He gets splinters in
his tongue

Page 65

- T. 13
N. 5
S. 16
I. 1
L. 8
A. 18
E. 11
T. 6
Y. 19
D. 2
I. 15
A. 9
I. 3
T. 12
W. 17
D. 4
H. 14
N. 10
P. 7

I DIDNT PLANET
THIS WAY

I didn't planet (plan it)
this way.

Page 66

SH EM IS LA ID IT
She mislaid it.

Page 67

- ED
- EC
- OU
- SW
- OR
- HE
- LD
- TB
- OU
- RN
- EH
- ND
- WA
- EF
- AR
- OU
- TU
- IP

HE WAS WIPED OUT
BEFORE HE COULD
TURN AROUND

He was wiped out
before he could turn
around.

Page 68

Encourage students to
write out each answer
BEFORE trying to
locate it in the answer
column.

- S
- L
- U
- A
- R
- G
- H
- A
- L
- E
- Y
- N
- E
- I
- F

HES REALLY
A FUNGI

He's really a fungi
(fun guy).

Page 68

- E
- U
- B
- A
- N
- S
- O
- R
- E
- T
- N
- I
- N

- I
- D
- R
- A
- T

ITSACHEW

It's a chew (achoo)

Page 70

- 6
- 12
- 5
- 15
- 4 cm by 7 cm
- 10 cm by 12 cm
- 6 m by 10 m
- 18 cm by 20 cm
- 8 cm by 14 cm

BOT HCR EWS WER
EMA ROO NED

Both crews were
marooned.

Page 71

You may wish to dis-
cuss the meaning
and/or derivation of
some of these formu-
las with your students.

- 288
- 252
- 600
- 260
- 100
- 2.4
- 376.8

MT RU SH MO RE
Mt. Rushmore

Page 72

For additional practice,
you may wish to have
students solve these
formulas for other let-
ters.

- O
- I
- T
- S
- L
- I
- E
- B
- T
- K
- U
- F
- U
- Y
- R
- E
- A
- Y
- W
- D

BUY A DEW IT
YOURSELF KIT

Buy a dewit (do it)
yourself kit.

Page 73

- 18, 6
- 9, 12
- 22, 8
- 14, 22
- 7, 9
- 12, 20
- 210, 130
- 9, 4, 2

SH EP AS SE DT HE
BU CK

She passed the buck.

Page 74

- 3 h
- 4 1/2 h
- 2 1/2 h
- 2 h
- 10 h
- 8 h
- 1 h
- 30 km

AN ON IO NR OL LS

An onion Rolls

Page 75

- A. 6 h
O. 1.5 h
N. 3 h
C. 54 km
A. 84 km/h
Y. 850 km/h
S. 48 km
U. 1200 km
C. 45 km
O SAY CAN UC

Page 76

- T
- H
- E
- Y
- A
- R
- E
- T
- H
- I
- N
- G
- S
- T
- O
- A
- D
- O
- R
- E

THEY ARE THINGS
TO ADORE

They are things to
adore (a door).

Page 77

- O
- 2
- 4
- S
- A

- B
- L
- 8
- N
- A
- E
- O
- N
- R
- S

THE TUBA 4

The tuba 4 (two-by-
four)

Page 78

- x^3
- $4x^3$
- $-4x$
- $-5x^5$
- a^3b^5
- $2ab^4$
- $5a^3b^3$
- $-12a^5b$
- x^3y^3
- $3x^2y^6$
- $-2x^7$
- $3y^2$
- $-3u^2v$
- $-2uv^3$
- $11v^2$
- $-3u^2v^{11}$

HE HAD A
LOCOMOTIVE

He had a loco motive.

Page 79

- $2n$
- $-6xy$
- $-12ab$
- $2u^2v^4$
- pq^2
- $24k^2w^2$
- $30m$
- $-3xyz$
- $-abc^3$
- $-4n^3$
- $3x^2y^2$
- a^3b
- $-4uv^3$
- $-2pq^3$
- $-8w^2$
- $-6mn^5$
- $9xy^2z^3$
- $9bc^2$

IT HAD A YACHT TO
OFFER

It had a yacht (lot) to
offer.

Page 80

For all factoring
puzzles, encourage
students to write out
each answer BEFORE
trying to locate it in
the answer column.

- A
- O
- E
- F
- D
- A
- O
- M
- F
- R
- G

- N
- R
- P
- W

FROM A FROG
PAWNED
From a frog pawned
(pond)

Page 81

- EXTRA
DRUMSTICKS
- A COAT OF
ARMS

- U
- D
- O
- K
- E
- I
- C
- X
- F
- M
- T
- A
- S
- R

Page 82

- H
- E
- H
- A
- D
- A
- L
- O
- V
- E
- L
- Y
- F
- I
- N
- I
- S
- H

HE HAD A LOVELY
FINISH

Page 83

You may wish to have
students write the
correct product for
each false statement.

- S
- A
- E
- T
- O
- I
- E
- Y
- U
- T
- B
- E
- C

- P
- N
- L

YES BUT I CANT
ELOPE
Yes, but I can't elope
(cantaloupe).

Page 84

- 6
- 15
- 13
- 24
- 4
- 17
- 2
- 8
- 18
- 1
- 20
- 10
- 5
- 22
- 3

- 11
- 23
- 7
- 21
- 16
- 9
- 19
- 12
- 14

HE WAS IN A
WEEKEND
CONDITION

He was in a weekend
(weakened) condition.

Page 85

- S
- E
- A
- G
- D
- A
- E
- L
- W
- A
- H
- A
- N
- Y
- C
- A
- T
- B
- W
- K
- I
- M

HE ALWAYS WANTED
A BIG MACK

Page 86

- 9
- 2
- 13

- 6
- 10
- 12
- 18
- 15
- 3
- 7
- 1
- 4
- 21
- 5
- 16
- 19
- 8
- 20
- 14
- 17
- 11

YOU WILL GET
MUSHED ROOMS
You will get mushed
rooms (mushrooms).

Page 87

- HE
- SF
- ST
- NT
- HE
- DS
- HI
- OR
- WA
- IN
- AV
- OD

HE WANTS THE
ODDS IN HIS FAVOR

Page 88

For all factoring
puzzles, encourage
students to write out
each answer BEFORE
trying to locate it in
the answer column.

- S
- T
- E
- G
- A
- O
- L
- E
- F
- A
- U
- T
- G
- O
- N
- I
- T
- R

BUYNOMEAL

Buy no meal
(binomial).

Page 89

THE CAT WHO JOINED THE RED CROSS BECAUSE IT WANTED TO BE A FIRST AID KIT

Page 90

1. W
2. H
3. E
4. N
5. H
6. E
7. S
8. I
9. T
10. S
11. O
12. N
13. T
14. H
15. E
16. T
17. H
18. R
19. O
20. W
21. N

WHEN HE SITS ON THE THROWN

When he sits on the thrown (throne)

Page 91

For each exercise, students must find one factor in each column of binomials. This format discourages "working backwards" from the answers. Students may need some help getting started.

1. $(3x + 1)(x + 2)$
2. $(2x + 3)(x + 1)$
3. $(3x - 1)(x - 5)$
4. $(7x - 2)(x - 1)$
5. $(2u + 1)(3u + 1)$
6. $(8u - 1)(u - 1)$
7. $(2u + 3)(5u + 1)$
8. $(3u - 2)(3u - 1)$
9. $(5u + 6)(u + 1)$
10. $(3n - 1)(n + 1)$
11. $(5n + 1)(n - 1)$
12. $(2n - 1)(n + 3)$
13. $(7n + 1)(n - 2)$
14. $(3t - 1)(t + 5)$
15. $(4t - 7)(t - 1)$
16. $(6t - 1)(t + 1)$
17. $(3t + 1)(t - 7)$

ROOMERS WERE FLYING

Roomers (rumors) were flying.

Page 92

You might emphasize to students that they should cross out TWO boxes for each exercise.

1. $(6x + 1)(x + 3)$
2. $(5x + 1)(x - 2)$
3. $(3x + 1)(3x + 4)$
4. $(7x + 8)(x - 1)$
5. $(2x - 5)(x - 8)$
6. $(5m + 3)(3m + 2)$
7. $(8m + 3)(m - 1)$
8. $(4m - 9)(m - 2)$
9. $(14m - 11)(m + 2)$
10. $(3m - 10)(m + 3)$

DO YOU WANT TIBET

Do you want to bet?

Page 93

This puzzle is similar to the one on page 91. Students must find one factor in each column of binomials.

1. $(2n + 7)(2n - 7)$
2. $(n + 6)(n + 2)$
3. $(n - 4)(n - 5)$
4. $(n + 8)(n + 8)$
5. $(n + 5)(n - 3)$
6. $(3n - 5)(n - 1)$
7. $(a + 7)(a - 3)$
8. $(5a - 1)(a + 2)$
9. $(2a + 5)(a + 3)$
10. $(1 - 3a^2)(1 + 3a^2)$
11. $(a - 5)(a - 6)$
12. $(5a + 1)(2a - 1)$
13. $(8u + 3)(u + 2)$
14. $(5u - 2)(5u - 2)$
15. $(3u - 14)(u + 1)$
16. $(u + 3)(u - 7)$
17. $(3u + 10)(2u - 1)$
18. $(2u + 9)(u - 2)$

BY FORMING CARP POOLS

By forming carp pools (car pools)

Page 94

1. O
2. E
3. N
4. O
5. C
6. H
7. N
8. O
9. T
10. P
11. R
12. C

CORN ON THE COP

Corn on the cop (cob)

Page 95

LOSE THEIR APPEAL GO DOWNHILL

1. T
2. A

3. D
4. E
5. S
6. W
7. I
8. G
9. R
10. H
11. N
12. O
13. P
14. L

Page 96

THE MAN WHO HUNTED BEAR UNTIL THE FOREST RANGER MADE HIM PUT ON CLOTHES

Page 97

No rearrangement of terms is needed in order to factor by grouping.

1. N
2. A
3. 4
4. E
5. B
6. R
7. I
8. L
9. T
10. P
11. N
12. G

WITHEASE

With ease (e's)

Page 98

1. R
2. A
3. N
4. T
5. S
6. E
7. F
8. H
9. U
10. I
11. D
12. L
13. O
14. W

THEIR WINDOWS FALL OUT

Page 99

1. R
2. N
3. O
4. S
5. A
6. H
7. I
8. B
9. F
10. T
11. E

12. L

THERES BEEN LESS INFLATION

There's been less inflation.

Page 100

1. SR
2. UI
3. EF
4. LL
5. AN
6. TH
7. TE
8. YQ
9. AT
10. UL
11. EA
12. EY

THATS REALLY QUITE AN EYEFUL

That's really quite an eyeful (Eiffel).

Page 101

THE REASON WHY ESCAPED BANK ROBBERS ALWAYS RUN TO CANADA IS BECAUSE THAT IS THE ONLY PLACE THEY HAVE

TORONTO (to run to).

Page 102

1. I
2. C
3. O
4. Y
5. L
6. S
7. J
8. R
9. B
10. F
11. A
12. E
13. N
14. T

TENNIS BALL FACTORY REJECT

Page 103

THE NOVICE WATER POLO PLAYER WHO WAS UPSET BECAUSE HIS HORSE COULD NOT SWIM

Page 104

HE GOT A BIG HAND

Page 105

Students may find these problems challenging, especially 6-10. Most students will need to see an example like problem 7 before they try the

last four problems.

You may split the page into two separate assignments.

1. 2 or 4
2. 5 or -3
3. $3/2$ or $-5/2$
4. $5/2$ or $-5/2$
5. 7, 8, or -8, -7
6. 5, 7
7. 4, 5 or -5, -4
8. 3, 5
9. 6, 8 or -8, -6
10. 4, 5, 6

CLIPSEW

Clip sew (calypso)

Page 106

Solutions for these problems represent physical dimensions, so students should reject negative solutions.

THE CROOKED FURNITURE DEALER WHO BUYS HOT WATERBEDS

- A. 7 cm by 10 cm
- B. 8 cm by 12 cm
- C. 5 cm by 9 cm
- D. 5 m
- E. 8 m
- F. 7 m by 8 m
- G. 5 m by 12 m
- H. 6 m by 8 m

Page 107

- 2
- $\frac{1}{7}$
- $x - 2$
- $\frac{x + 5}{3}$
- $\frac{x + 4}{x - 9}$
- $\frac{n + 2}{n - 3}$
- $\frac{n - 4}{n + 1}$
- $\frac{n + 9}{n + 2}$
- $\frac{4}{n - 1}$
- $\frac{1}{n}$
- $\frac{2}{5}$
- $\frac{b + 7}{2(b + 3)}$
- $\frac{3}{2(b - 5)}$
- $\frac{b + 2}{2b - 1}$
- $\frac{6b^2}{b + 5}$

ATAILGATOR

A tail gator (tailgater)

Page 108

The last four exercises involve polynomials in two variables.

- A SICK CHUTER
- JUST BARGE IN
- R
- H
- A
- N
- E
- I
- J
- T
- K
- U
- C
- S
- G
- B

Page 109

A RHYTHMIC TICK

Arithmetic

Page 110

JUSTIN CASE

LES DANCE

I I SERR

- T
- A
- U
- R
- L
- C

- D
- I
- J
- E
- N
- S

Page 111

- H
- D
- E
- I
- G
- L
- S
- N
- T
- O

SIGN ON THE DOTTED LION

Sign on the dotted lion (line).

Page 112

- EB
- EN
- TH
- HL
- EY
- OT
- AR
- DS
- EG

THEY ARE BOTH LEGENDS

They are both legends (leg ends).

Page 113

- U
- E
- T
- I
- D
- W
- S
- L
- A

IT WAS ASSAULTED

It was assaulted (a salted).

Page 114

These exercises are challenging.

- R
- A
- Y
- S
- O
- B

UCLA

(You see L.A.)

Page 115

- VARIABLE
- EQUATION
- SOLUTION
- DISTRIBUTIVE

- FORMULA
- COEFFICIENT
- OPPOSITE
- RECIPROCAL
- FACTOR
- POWER
- POLYNOMIAL
- BINOMIAL
- PRIME
- INTEGERS
- QUADRATIC

TO PROVIDE BETTER QUARTERS

To provide better quarters

Page 116

You may prefer to use these questions one at a time.

- A, B, C
- $\frac{2178}{x \ 4}$
8712
- Monday
- 3:36 P.M.
- 7 1/2 ft
- Rollo
- Answers will vary.
- a) 33
b) 59

Each difference is the sum of the digits of the preceding number.

Page 117

- G
- R
- I
- A
- C
- M
- K
- U
- O
- H
- S
- T

A THOUGHT STRUCK HIM

Page 118

- $\frac{n}{2}$
- $\frac{2n}{3}$
- $\frac{31n + 21}{12}$
- $\frac{13n + 4}{6}$
- $\frac{n - 3}{2}$
- 2n
- $\frac{19x - 4}{18x}$
- $\frac{3x + 1}{6}$

- $\frac{23x - 29}{15x}$
- $\frac{2(5x + 4)}{3x}$
- $\frac{9x - 2}{5x}$
- $\frac{4x + 9}{15}$

A CLAM SHOULDER

Page 119

- S
- Y
- A
- E
- I
- K
- W
- R
- D
- T

IT WAS A DIRTY TREK

It was a dirty trek (trick).

Page 120

- DCA
- THE
- EST
- WHI
- ERM
- BIR
- TCH
- RLY
- HEG

THE WHIRLY BIRD CATCHES THE GERM

The whirlybird (early bird) catches the germ (worm).

Page 121

- O
- A
- E
- W
- I
- H
- B
- N
- R
- S

HE HAS SNOW BRAINS

He has no brains.

Page 122

The last four exercises are more challenging. Many students will need to see an example like G or H before they can do these.

THE DRIVING TEACHER WHO DECIDED TO GRADE ON THE CURVE

Page 123

- SK
- HU
- TH
- ST
- BE
- NT
- HE
- OT
- SH

ATRRAINHITHIM

A train hit him.

Page 124

- C
- R
- I
- E
- S
- H
- W
- T

SWITCH HITTERS

Page 125

It is important that students discriminate between ratios in which units of measure can and cannot be cancelled (rates). Parts I and II of this puzzle correspond to these two kinds of ratios. Notice that in Part I, answers are in fraction form; in Part II, answers are in decimal form.

- 1/6
- 9/2
- 3/8
- 7/4
- 3/20
- 4/1
- 2/25
- 8/5
- 24/1
- 5/6
- 2/3
- 5/3
- 2/13
- 24/25
- 20
- 22.5
- 400
- 32
- 7.5
- 0.3
- 6.2

THEY ALWAYS HAVE SECONDS

Page 126

- 40, 16
- 45, 105
- 45, 20
- 375, 625
- 14, 21, 35
- 96, 36, 48
- 24, 18, 6
- 8, 8, 12, 24, 28
- 32, 48

NO HE JUST
GRAZED THEM

No, he just grazed
them.

Page 127

TILLIE N DATIME

(Till the end of time)

GORDON BLUDDY

(Gored and bloody)

- U. 21
- E. 32/3
- Y. 8/9
- O. 33/16
- G. 5/8
- I. 20/3
- B. 38/7
- N. -12
- A. 12/7
- M. 15
- R. -43/4
- T. 84/5
- D. 11/4
- L. -3/2

Page 128

- 210
- 112.5
- 125
- 43.2
- 6.8
- 13
- 2150
- 9600

ITSDOGONICE

It's dog on ice
(doggone nice).

Page 129

- A FORGET ME
GNAT
 - FROSTBITE
- G. 30/7
 - I. 20
 - O. 9/4
 - S. 11/2
 - A. 1/2
 - E. -2
 - M. 23
 - B. -5/4
 - R. -17/15
 - N. 5
 - F. -4
 - T. 1

Page 130

- 18
- 40

- 30
- 12
- 68, 70
- 8, 9
- 9, 18
- 100

BE A LITTLE
BOULDER

Be a little boulder
(bolder).

Page 131

THE CROSS EYED
COLLEGE
PROFESSOR WHO
HAD NO CONTROL
OVER HIS PUPILS

- A. 3
- B. 10
- C. 3/4
- D. -4
- E. 7/2
- F. -1/2
- G. -8
- H. 7
- I. -11/3
- J. 1
- K. 8/3
- L. -2

Page 132

- 2
- 4/3
- 1/2
- 6, -2
- 6, 1
- 1/2, 3
- 7, 3
- 1 (7 is an extra-
neous solution.)
- 3, 1

SISBOOMBAH

Sis boom bah

Page 133

You may wish to have
students use
calculators for all
puzzles involving
percent.

- S. 16.08
- I. 0.37
- H. 1.5
- N. 77
- T. 52.2
- U. 0.255
- W. 30
- A. 4.25
- I. 0.07
- E. 6
- S. 175
- A. 0.099
- I. \$37.95
- C. 1050
- V. \$590
- N. \$238
- L. \$1630

IT WAS SUCH A VILE

INN (violin)

Page 134

You may wish to have
students use
calculators for all
puzzles involving
percent.

DETERMINED WORM
CROSSING A RAZOR
BLADE

- N. 11.34
- O. 25.2
- G. 30
- I. 60
- T. 32
- A. 7
- C. 54.12
- E. 11
- L. 6.4
- W. 5
- Z. 85
- S. 24
- B. 70
- M. 45
- D. 18
- R. 200

Page 135

- NAP SACK
- WOMB MATES
- A DOLLAR
WASTED

- T. 224
- P. 31.2
- O. 1.25
- C. 15
- B. 26 2/3
- E. 3.5
- K. 45
- R. 32
- D. 200
- N. 225
- L. 19.6
- M. 140
- A. 33 1/3
- W. 90
- S. 7000

Page 136

- 5.70
- 7280
- 62 1/2
- 43 1/3
- 12,500
- 40,000
- 1.5
- 32 1/2

HISSANDHEARSE

Hiss and hearse (his
and hers)

Page 137

- 20%
- 13 1/3%
- 55%
- 6 2/3%
- \$3750
- 215

7. 7.5%

8. \$126

HE HAD A SUITE
TOOTH

He had a suite (sweet)
tooth.

Page 138

For additional
practice, have
students solve these
formulas for other
letters. (Use page 72
for practice with
formulas having no
variables in the
denominator.)

- 1. E
- 2. T
- 3. R
- 4. I
- 5. U
- 6. A
- 7. I
- 8. C
- 9. U
- 10. F
- 11. W
- 12. T
- 13. S
- 14. K
- 15. T
- 16. R

A FUTURE WRIST
TICK

A future wrist tick
(futuristic)

Page 139

The last three
exercises require
splitting a sum of
money into two parts.
You may remind
students that these
can be represented as
x and SUM - x.

- 1. 100
- 2. 600
- 3. 750
- 4. 200
- 5. \$300, \$600
- 6. \$350, \$550
- 7. \$2000, \$3500
- 8. \$500, \$400
- 9. \$1200, \$1800
- 10. \$3000, \$4000

ITISASLOPEUP

It is a slope up (slow
pup).

Page 140

- 1500
- 8000
- \$2000, \$5000
- \$12,000; \$15,000
- \$720, \$520
- \$2100, \$3700

7. \$6000

HE HAD TO WORK
ON WICK ENDS

He had to work on
wick ends
(weekends).

Page 141

Exercises 1, 2, 3, and
7 represent one
variation of dry
mixture problems;
exercises 4, 5, and 6
represent another. You
might wish to use
exercises 1 and 4 as
examples in class.

IS — 8, 12
ES — 100, 50
RT — 1, 2

IT — 2
RI — 7
PA — 250
DG — 16, 9

IT IS PART RIDGES

It is part ridges
(partridges).

Page 142

Exercises 1, 2, 3, and
4 represent one
variation of liquid
mixture problems;
exercises 5, 6, and 7
represent another. You
might wish to use
exercises 1 and 5 as
examples in class.

- 1. 24 L
- 2. 8 L
- 3. 225 g
- 4. 31.2 g
- 5. 25 L
- 6. 4 kg
- 7. 3.5 mL

HEWENTDATAWAY

He went data way
(that-a-way).

Page 143

- 1 5/7 h
- 1 7/8 d
- 3 3/7 h
- 2 6/17 h
- 6 h
- 4 4/5 h
- 60 d

ABRICKLAYER

A bricklayer

Page 144

HE WAS CREDITED
WITH TWENTY-ONE
STOLEN BASSES
(stolen bases).

Page 145

1. (2,1)(4,-5)(-1,10)
2. (0,4)(-3,-2)(3,10)
3. (3,7)(-1,-3)(1,2)
4. (0,-1)(-2,-9)(1,3)
5. (3,9)(-3,9)(-1,1)
6. (1,5)(-1,5)(-2,11)
7. (1,-1)(8,0)(-6,-2)
8. (2,5)(-2,-5)(-5,-2)

HIS MOTHER WAS A
WAFER SO LONG

His mother was a
wafer so long (away
for so long).

Page 146

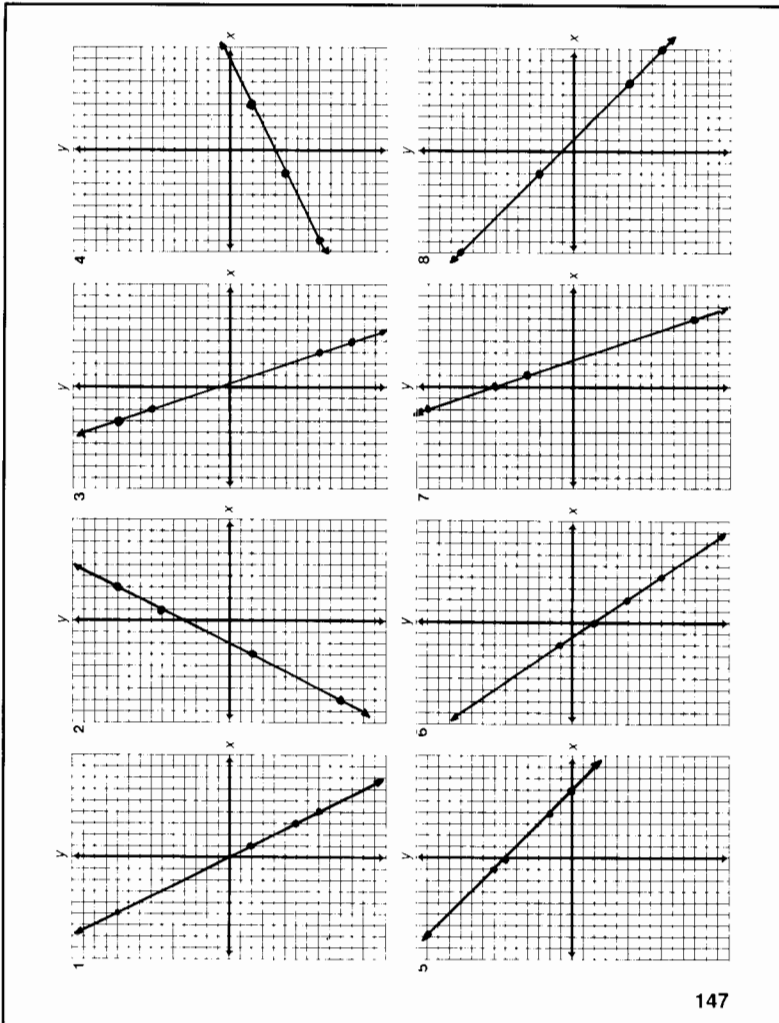
Coordinate grids
suitable for graphing
these functions are on
page 147.

1. -2 -8 10 -6
2. 10 -10 6 -2
3. -8 10 -11 7
4. 1 -5 -2 -8
5. 2 7 0 6
6. -8 -5 -2 1
7. -11 4 7 13
8. 3 10 -8 -5

HER BROTHER SAID
HE WANTED HIS
PALM RED (read).

Page 147

This page is useful not
only for graphing the
functions on pages
146 and 149, but also
for a variety of other
graphing activities.



Page 148

1. SHE WAS A
STEP DOTTER
2. A LUMBER YARD
1. P
2. O
3. W
4. E
5. Y
6. U
7. H
8. B
9. D
10. L
11. A
12. R
13. M
14. S
15. T

Page 149

You may wish to have
students graph these
equations. There is a
suitable set of
coordinate grids on
page 147.

1. 3 9 -5
2. 2 -4 -7
3. 6 2 0
4. 1 3 5
5. 10 1 -5
6. 2 0 -3
7. -1 -8 2
8. 8 -1 -10

YOU HAVE ACID IN
DE CHEST YUNN

You have acid in de
chest, Yunn
(indigestion).

Page 150

Coordinate grids
suitable for graphing
these equations are
on page 151.

THE FARMER WHO
NAMED HIS PET

1. ROOSTER
2. ROBINSON
3. BECAUSE IT
4. CREW SO

Page 151

This page is useful not
only for graphing the
equations on page
150, but also for a
variety of other
graphing activities.

Page 152

- E. 2/3
- O. 4
- G. 1/2
- S. 3
- O. 1
- N. -5/2
- V. -2
- L. 3/7

GLOVES ON

Page 153

The objective for this
page is to find the
slope *not* using the
graph. The first six
exercises, however,
review finding the
slope using the graph.

1. 4/3
2. -2
3. -3/5
4. 3
5. -1/4
6. 0
7. 2/3
8. -1/3
9. 2/5
10. -3/4
11. 1/2
12. -6
13. -3/2
14. 5/3
15. 4
16. 1
17. -4/7
18. -7/2

A ROBBER DUCKY

A robber (rubber)
ducky

Page 154

1. $y = 2x - 3$
2. $y = 2/3x + 1$
3. $y = -2x - 4$
4. $y = -3/2x - 1$
5. $y = 3x + 5$
6. $y = -x + 3$
7. $y = 4/3x$
8. $y = -1/4x + 2$
9. $y = -3$
10. $y = 2/5x - 5$

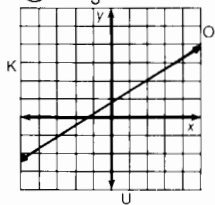
HE THOUGHT IT
WAS DEVINE

He thought it was
devine (the vine).

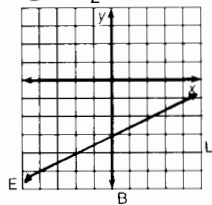
Whom Should You See at the Bank If You Need To Borrow Money?

Use the slope and y -intercept to graph each equation below. The graph, if extended, will cross a letter. Print this letter in each box that contains the number of that exercise.

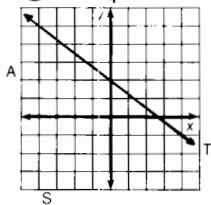
① $y = \frac{2}{3}x + 1$



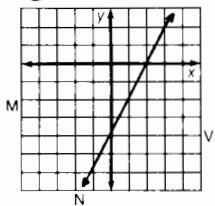
② $y = \frac{1}{2}x - 3$



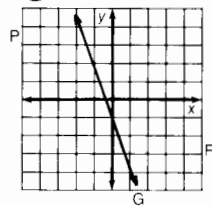
③ $y = -\frac{3}{4}x + 2$



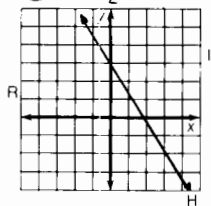
④ $y = 2x - 4$



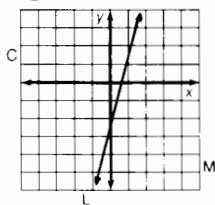
⑤ $y = -3x - 1$



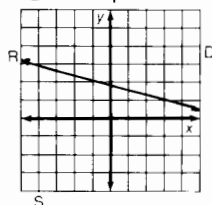
⑥ $y = -\frac{3}{2}x + 3$



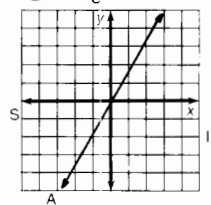
⑦ $y = 4x - 2$



⑧ $y = -\frac{1}{4}x + 2$



⑨ $y = \frac{5}{3}x$



3 6 2 7 1 9 4 9 8 8 9 4 5 2 8
T H E L O A N A R R A N G E R

OBJECTIVE 5 | To graph a line given its equation in slope-intercept form

THE LOAN
ARRANGER

The loan arranger
(Lone Ranger)

Page 156

O. $y = -\frac{2}{5}x + 2$

N. $y = -\frac{4}{3}x + 3$

L. $y = \frac{2}{3}x - 7$

I. $y = \frac{1}{4}x + 5$

A. $y = \frac{3}{5}x - 1$

U. $y = -\frac{7}{4}x - 4$

R. $y = 2x - \frac{7}{2}$

I. $y = -3x + \frac{1}{3}$

S. $y = 6x - 4$

G. $y = -\frac{4}{3}x + \frac{8}{3}$

N. $y = \frac{5}{9}x + \frac{7}{9}$

F. $y = \frac{2}{7}x$

T. $y = 6x - \frac{1}{2}$

F. $y = \frac{1}{4}x + 1$

H. $y = \frac{2}{3}x + \frac{1}{2}$

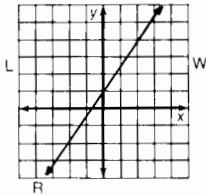
ITS FOR HALVING
FUN

It's for halving
(having) fun.

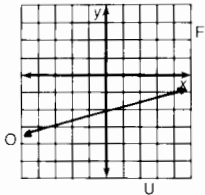
Why Does a Poor Man Drink Coffee?

Use the slope and y -intercept to graph each equation below. The graph, if extended, will cross a letter. Print this letter in each box that contains the number of that exercise.

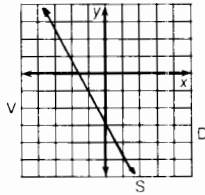
① $-3x + 2y = 2$



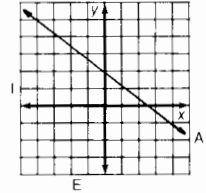
② $x - 4y = 8$



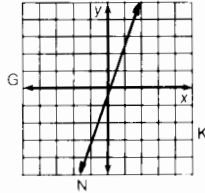
③ $2x + y = -3$



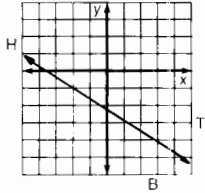
④ $2x + 3y = 6$



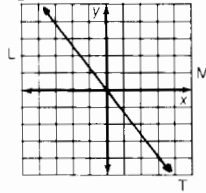
⑤ $3x - y = 1$



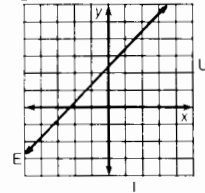
⑥ $-3x - 5y = 10$



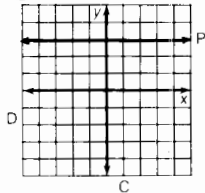
⑦ $4x + 3y = 0$



⑧ $2x - 2y + 5 = 0$



⑨ $y - 3 = 0$



6 8 6 4 3 5 2 9 1 2 9 8 1 7 8 4
H E H A S N O P R O P E R T E A

OBJECTIVE 5.1 To graph a line given its equation (excludes vertical lines)

HE HAS NO PROPER TEA

He has no proper tea (property).

Page 158

SHE HAD A BUM STEER

Page 159

As an additional activity, you might have students write each equation in standard form and/or graph it.

1. R
2. O
3. M
4. E
5. U
6. H
7. I
8. F
9. J
10. T
11. L
12. S

JUST FOR THE SMELL OF IT

Page 160

1. DE
2. CT
3. TH
4. AP
5. EY
6. AR
7. ER
8. MA
9. FE
10. PE

THEY MADE A PERFECT PEAR

They made a perfect pear (pair).

Page 161

Coordinate grids for graphing these systems of equations are on page 162.

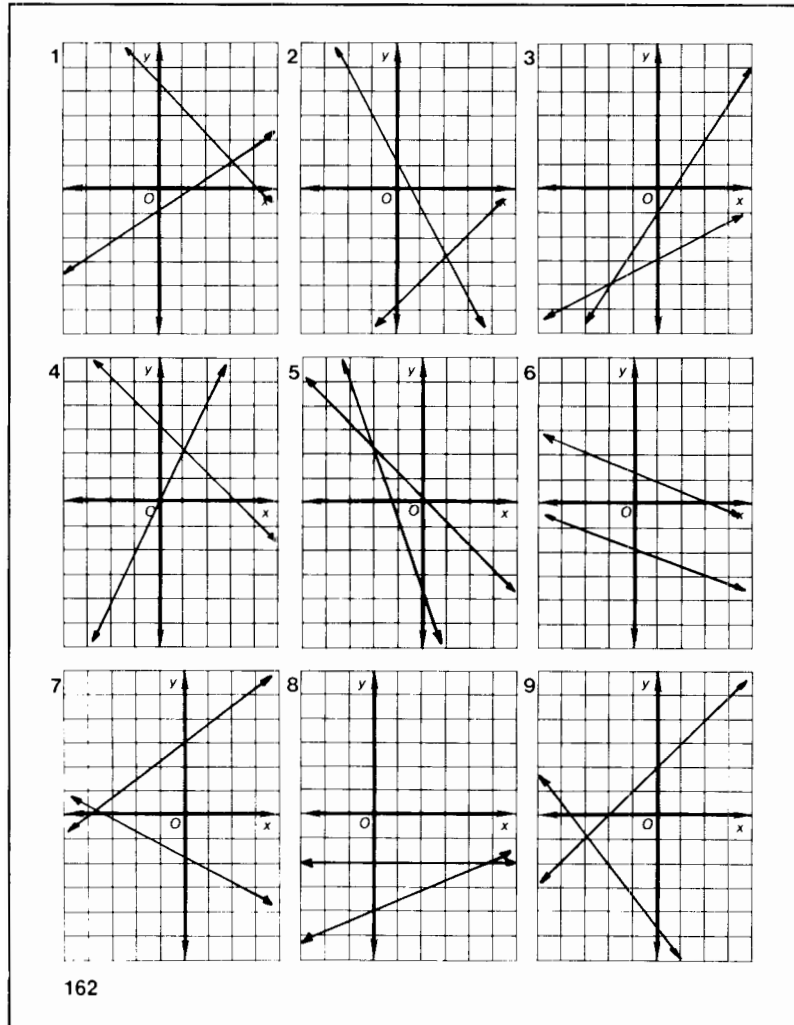
1. (3, 1)
2. (2, -3)
3. (-2, -4)
4. (1, 2)
5. (-2, 2)
6. no solution
7. (-4, 0)
8. (5, -2)
9. (-3, -1)

EGGSSPEARAMINT

Eggs spear a mint (experiment)

Page 162

This page is intended for graphing the systems of equations on page 161.



162

Page 163

1. (4, 8)
2. (5, 2)
3. (1, -3)
4. (9, 2)
5. (6, -1)
6. (5, 3)
7. (-1, 4)
8. (1/2, 7)
9. (-1/3, 4/3)
10. (-4, -3)
11. (5/2, -1/2)
12. (8, 0)

HE IS HOPING FOR WHIRLED PEAS

He is hoping for world peace.

Page 164

You might have students solve one or two of the systems by

graphing in the given coordinate system. This puzzle format makes it convenient to compare the two methods of solution.

1. (3, 2)
2. (2, -1)
3. (-5, 3)
4. (0, 6)
5. (-3, -1)
6. (5, 4)
7. (-2, 0)
8. (5, -2)
9. (3, 6)
10. (1, -5)
11. (-4, 1)
12. (4, -4)

A SUDDEN DEBT PAYOFF

A sudden debt payoff (sudden-death playoff)

Page 165

1. (2, 3)
2. (-1, 4)
3. (5, -2)
4. (3, 4)
5. (1, -3)
6. (-2, -1)
7. (-4, 1)
8. (1/3, 2)
9. (-5, 3/2)
10. (0, -4)
11. (-1, -5)
12. (1/2, 0)

OPENTOAD

Open toad (open-toed)

Page 166

1. 36, 54
2. 26, 30
3. 655

4. 13, 31
5. 26, 49
6. 24, 4
7. 370, 130
8. 16, 12

SO THAT WE CAN HAVE LAWN ORDER

So that we can have lawn order (law and order)

Page 167

THE FARMER WHO FED HIS COWS BIRDSEED AND STARTED SELLING CHEEP MILK

- A. (2, 3)
- B. (1, -2)
- C. (1, -4)
- D. (-2, 4)
- E. (2, 1)
- F. (1, 4)
- G. (-1, -2)
- H. (0, 3)
- I. (2, -2)
- J. (-5, 0)
- K. (5, 2)
- L. (-1, -1)

Page 168

- A. (3, 1)
- I. (-1, 2)
- R. (2, -3)
- T. (4, 0)
- A. (-1, 5)
- O. (4, -2)
- F. (-6, -4)
- M. (1, 4)
- N. (0, -5)
- L. (3, 8)

A FLAT MINOR

A flat minor (miner)

Page 169

1. 12, 9
2. 24, 8
3. 13, 6
4. \$5, \$7
5. 18, 6
6. \$1.50
7. \$20, \$35
8. 14

A HOT AIR BABOON

A hot-air balloon

Page 170

- | | |
|---------------|------------|
| 1. 16 km/h | 4 km/h |
| 2. 550 km/h | 50 km/h |
| 3. 8 km/h | 1 km/h |
| 4. 900 km/h | 100 km/h |
| 5. 12 km/h | 4 km/h |
| 6. 200 m/min | 40 m/min |
| 7. 325 km/h | 25 km/h |
| 8. 8.75 m/min | 3.75 m/min |

DECALFINATED

(decaffeinated)

Page 171

1. 19, 11
2. 13, 5
3. 26, 20
4. 9, 14
5. 38, 19
6. 16, 10
7. 15, 35

ABIGFIRE

A big fire (A "three-alarmer" is a big fire.)

Page 172

1. 36
2. 39
3. 53
4. 84
5. 28
6. 47
7. 38

PLUG INN

Page 173

1. \$60
2. \$1000, \$2000
3. 2 1/2 cups
4. \$3000, \$1500
5. \$2000, \$1200
6. 40, 30

AFLYINGSAWSIR

A flying saw, sir (saucer)

Page 174

You may prefer to use these questions one at a time.

1. 3 pounds
 2. 54
- $$\begin{array}{r} \times 3 \\ 54 \\ \hline 162 \end{array}$$
3. 1, 2, 4, 5, 7, 10, 13. Once 3 consecutive numbers can be attained, all higher scores can be also.
 4. \$2.10
 - 5.



6. 40 inches
7. 16 cm²
8. 0 The factor (x-x) equals 0.

Page 175

This puzzle will help illustrate the meaning of relation, function, domain, and range. You may wish to have students write the domain and range for each relation.

1. f
2. f
3. not f
4. f
5. f
6. not f
7. f
8. f
9. not f
10. not f
11. f
12. f

HIMA

Hi, Ma.

Page 176

1. A. 7 B. -3
2. A. 140 B. 0
3. A. -11 B. 1
4. A. 1/2 B. -1/3
5. {-4, 2, 8}
6. {24, 14, 4}
7. {49, 1, 31}
8. {-4, 3, 12}
9. {-16, 0}
10. {-5, 4}

A FLYER QUACKER

A fire cracker

Page 177

These hypothetical functions will help illustrate concepts of function, slope, domain, range, and initial conditions. The questions at the bottom are suggestions. You may wish to elaborate or extend the discussion.

Page 178

You might have students individually, or as a class, sketch each of these functions BEFORE you pass out copies of this page.

Page 179

SKETCHING FUNCTIONS III

Make a sketch for each function described below. Use your knowledge of the relationships described.

(A) At a fixed price per ounce, the cost of buying gold is a function of the number of ounces you buy.

(B) The height of your head above the ground as you ride a Ferris wheel is a function of the time since you got on.

(C) The total cost of operating a lemonade stand is a function of the amount of lemonade sold.

(D) The profit from operating a lemonade stand is a function of the amount of lemonade sold.

(E) The amount of water in a pan on a burner that is turned on "high" is a function of the time since the burner was turned on.

(F) The height of a ball that is dropped from a height of 10 feet is a function of the time since it was dropped.

OBJECTIVE 1 - To sketch the graph of a function using knowledge of real-world relationships

179

Page 180

- | | |
|------|------|
| 1. y | -8 |
| 7 | -7 |
| 1 | -4 |
| -3 | 1 |
| -5 | 8 |
| 2. y | 5. y |
| 4 | -6 |
| -1 | 1 |
| -4 | 6 |
| -5 | 9 |
| -4 | 10 |
| -1 | 9 |
| 4 | 6 |
| 3. y | 1 |
| 5 | -6 |
| 0 | 6. y |
| -3 | 11 |
| -4 | 1 |
| -3 | -5 |
| 0 | -7 |
| 5 | -5 |
| 4. y | 1 |
| 8 | 11 |
| 1 | |
| -4 | |
| -7 | |

Page 181

There is a coordinate grid for graphing these

equations on page 182.

1. $y = 4x$
2. $y = 1/3x$
3. $y = 2.5x$
4. $y = 1.6x$
5. $y = 2/3x$
6. $y = -5x$
7. $y = x$
8. $y = 0.75x$
9. $y = 10x$
10. $y = 0.15x$
11. $y = 22/7x$

IT WAS AN X SIGHTING MOMENT

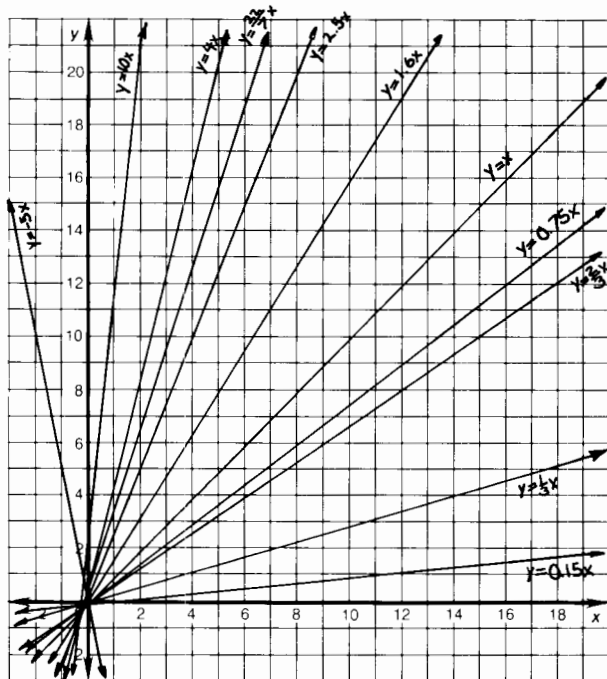
It was an X sighting (exciting) moment.

Page 182

This page is for graphing the functions on page 181. The questions at the bottom are useful for an assignment or class discussion.

9. k = rate of speed
10. k = rate of interest
11. $k \doteq \pi$

Direct Variation "Grafun"



1. Why does the graph of an equation expressing direct variation always pass through the origin?
2. As k increases from 0.15 to 10, what happens to the graph of $y = kx$? Describe the graph when k is negative.
3. What is the meaning or significance of k in the equation for Exercise 9? For Exercise 10? For Exercise 11?

182

OBJECTIVE 1-g: To graph equations expressing direct variation

Page 183

1. 135
2. 72
3. 3.75
4. 300
5. 33.3
6. 87.5
7. 10

ANORDEREDPAIR

An ordered pair

Page 184

The exercises in the right column may provide examples to help students gain an intuitive feeling for inverse variation. In the last exercise, the constant of variation equals the approximate speed of sound in air.

SHE LOST HER
WHEY

Page 185

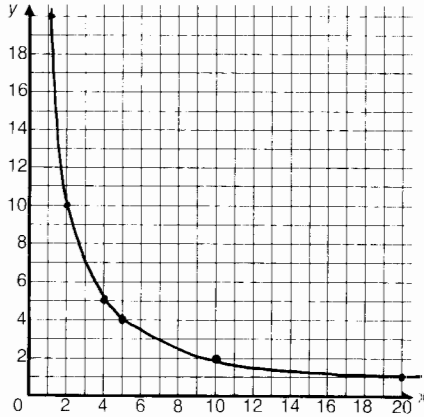
You may wish to use this page as a class activity, making an overhead transparency to guide discussion.

INVERSE VARIATION "GRAFUN"

Complete each table and graph the equation.

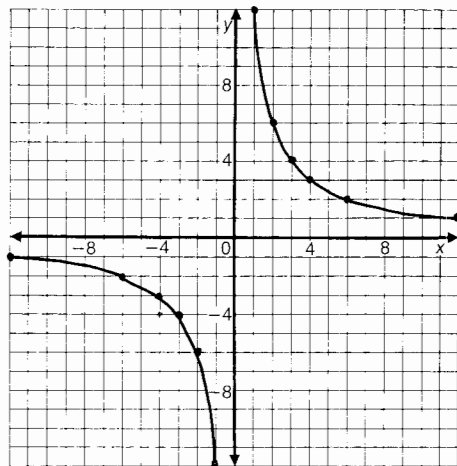
① $y = \frac{20}{x}$

x	y
1	20
2	10
4	5
5	4
10	2
20	1



② $y = \frac{12}{x}$

x	y
1	12
2	6
3	4
4	3
6	2
12	1
-1	-12
-2	-6
-3	-4
-4	-3
-6	-2
-12	-1



OBJECTIVE 1 : To graph equations expressing inverse variation.

185

Page 186

- 15
- 8
- 22.50
- 30
- 21
- 1.2
- 6.75

THEY MADE HEADLINES

They made headlines (head lines).

Page 187

- D. 4 A. 100
- T. 14 E. 735
- A. 0.06 O. 13.50
- I. 288 K. 32
- M. 45 F. 11.25
- N. 3.6 A. 0.4

7. Y. 2000 R. 980

I AM A FRAYED KNOT

I am a frayed knot (afraid not).

Page 188

You may wish to use these formulas in discussing with students the effect on the dependent variable of doubling, tripling, etc., one of the independent variables.

- $V = kBh$
- $t = kW/n$
- $P = kV^2/R$
- $h = kW/r^2$

5. $E = kmv^2$

6. $I = kAH/T$

7. $m = k^2wt$

8. $V = kT/P$

9. $I = kms^2$

10. $i = kA/d^2$

11. $s = kbd^2/\ell$

12. $g = km_1m_2/d^2$

Page 189

THEY BURIED HIM SIX DOWN AND EIGHT ACROSS

In Music, What Does "Allegro" Mean?

Solve each inequality below. Draw a straight line connecting it to the inequality that describes the solution set. The line will cross a number and a letter. Write the letter in the matching numbered box at the bottom of the page.

1. $4x - 7 > 17$	5	$x > 2$
2. $2x + 36 < 4$	E	$x \geq -4$
3. $10 - 8x > 26$	18	$x > 6$
4. $-6x - 1 \leq 23$	10	$x \leq -10$
5. $6 + 11x > -60$	8	$x < -6$
6. $-9x + 5 \geq -58$	13	$x < -16$
7. $32 - 15x < 2$	7	$x > -1$
8. $42 > 3x + 3$	17	$x < 2$
9. $-26 < 4 - 5x$	1	$x \leq 7$
10. $26 \leq -7x - 2$	15	$x \leq -4$
11. $10x + 18 \geq -72$	12	$x \leq 38$
12. $12 > -14x - 2$	14	$x < -2$
13. $4x - 68 > -4$	2	$x < 13$
14. $37 \leq 17 - 2x$	8	$x \geq -9$
15. $-3 - 7x > -17$	11	$x > -4$
16. $14 < 5x + 34$	16	$x > 16$
17. $58 - x \geq 20$	1	$x > -6$
18. $6x - 4 < -40$	18	$x < 6$

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
A	L	I	N	E	O	F	C	H	O	R	U	S	G	I	R	L	S

OBJECTIVE 2 b: To solve inequalities of the form $ax + b > c$, where a is an integer.

Page 191

- $x > 6$
- $x \geq -15$
- $x > 3$
- $x \leq -2$
- $x < 44$
- $x > 60$
- $x \geq 32$
- $x \leq -50$
- $x < -48$
- $x < 21$
- $x \geq 20$
- $x \geq -10$
- $x \geq 15$
- $x < -70$
- $x \geq 5$
- $x < 0$

ABORINGJOB

A boring job

Page 192

- $x > 4$
- $x \geq 7$
- $x < -8$
- $x \leq -11$
- $x > 9$
- $x < -1$

- $n \geq 3$
- $n \geq -6$
- $n > 2$
- $n \geq 1$
- $n < -3$
- $n < -2$

HE WAS PROPOSING A TOAST

Page 193

You may wish to give each student a copy of page 194 to use as a worksheet for this puzzle.

- H
- R
- E
- D
- A
- G
- N
- T
- W
- P
- O
- C

- S
- I

A PERSON WITH GOOD ICE SIGHT

A person with good ice sight (eyesight)

Page 194

This page is a worksheet for pages 193 and 195. Students can graph one inequality on the first number line, another on the second number line, and their union of intersection on the third.

Page 195

You may wish to give each student a copy of page 194 to use as a worksheet for this puzzle.

- I
- O

- C
- E
- N
- G
- M
- H
- T
- S
- P
- A

HE GOT A PANE IN HIS STOMACH

He got a pane (pain) in his stomach.

Page 196

- EI
- EN
- HE
- WE
- US
- IT
- BE
- AR
- TS
- NE
- OR
- CA
- DO
- NE
- LL
- RR

BECAUSE ITS NEITHER RARE NOR WELL DONE

Because it's neither rare nor well done

Page 197

- A
- Y
- P
- E
- M
- T

MEETPATTY

Meet (meat) patty.

Page 198

This is a two-page puzzle. You may wish to assign only one page.

- E
- S
- T
- O
- H
- W
- I
- F
- R
- A
- B

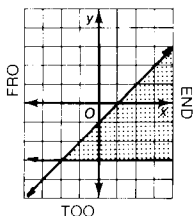
Page 199

THEIR FATHER WAS A BOAR
Their father was a boar (bore).

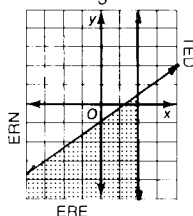
What Did the Toothless Old Termite Say When He Entered a Tavern ?

Graph each pair of inequalities below and indicate the solution set of the system with crosshatching or shading. The crosshatching or shading, if extended, would cover a set of three letters. Print these letters in the three boxes at the bottom of the page that contain the exercise number.

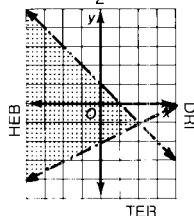
① $y \leq x - 1$
 $y \geq -3$



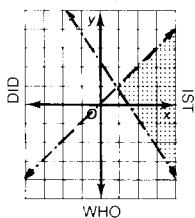
② $x \leq 2$
 $y \leq \frac{2}{3}x - 1$



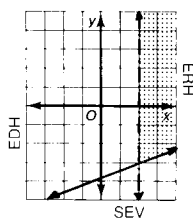
③ $y < -x + 1$
 $y > \frac{1}{2}x - 2$



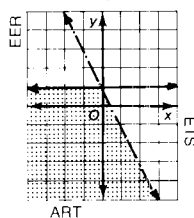
④ $y < x$
 $3x + 2y > 4$



⑤ $x - 3y \leq 12$
 $x > 2$



⑥ $y \leq 1$
 $2x + y < 1$



4	4	4	3	3	3	6	6	6	1	1	1	5	5	5	2	2	2
I	S	T	H	E	B	A	R	T	E	N	D	E	R	H	E	R	E

Famous Last Word

1 130	1 12	8 9	0.571428	5 27	7 33
-0.227	0.064	0.7	2 11	2 76	0.4183
1 8	0.223	0.475	15 6	1 111	-\$43.0
4 3			0.0625		-0.5717

A FAMOUS LAST WORD IS HIDDEN IN THE RECTANGLE ABOVE. TO FIND IT: Express each fraction below as a repeating or terminating decimal. Express each decimal as a fraction in lowest terms. Find your answers in the rectangle. Shade in each area containing a correct answer.

Express as a repeating or terminating decimal:

- ① $\frac{7}{9}$ $0.\overline{7}$
- ② $\frac{3}{8}$ 0.375
- ③ $\frac{5}{12}$ $0.4\overline{16}$
- ④ $\frac{11}{4}$ 2.75
- ⑤ $\frac{3}{11}$ $0.\overline{27}$
- ⑥ $-\frac{5}{22}$ $-0.2\overline{27}$
- ⑦ $\frac{1}{16}$ 0.0625
- ⑧ $-\frac{4}{7}$ -0.571428

Express as a fraction in lowest terms:

- ⑨ $0.\overline{8}$ $\frac{8}{9}$
- ⑩ $-0.1\overline{8}$ $-\frac{2}{11}$
- ⑪ $1.\overline{3}$ $\frac{4}{3}$
- ⑫ $-0.2\overline{1}$ $-\frac{7}{33}$
- ⑬ 0.125 $\frac{1}{8}$
- ⑭ $0.\overline{83}$ $\frac{5}{6}$
- ⑮ $-0.0\overline{83}$ $-\frac{1}{12}$
- ⑯ 0.009 $\frac{1}{111}$

OBJECTIVE 3 a To express a fraction as a repeating or terminating decimal to express a repeating decimal as a fraction in lowest terms

Page 202

- S. 7
 T. 1
 H. 10
 I. 30
 H. 2
 S. 6
 O. 8
 R. 5
 S. -8
 E. -15
 I. -100
 T. 3/4
 E. 20
 T. -90
 N. -120
 S. 1/3
 O. 9
 E. 15
 R. 11
 W. 60
 E. -9/2
 A. 0.5
 I. -0.7
 E. 0.1
 E. 1
 T. 3
 H. 10
 P. 14
 A. -1.2
 T. 0.02
 S. -0.11
 M. 2/3

IT IS THE SPOT WHERE THE SONS RAISE MEAT

It is the spot where the sons raise meat (sun's rays meet).

Page 203

- S. rational number
 I. numerator by denominator
 A. terminating decimal
 D. repeating decimal
 S. terminating or repeating
 H. fraction
 F. irrational number
 H. repeat
 I. terminates
 N. 0.1212212221...
 P. real numbers
 S. decimal

FISH AND SHIPS (chips)**Page 204**

It may be useful to have students write the radicand in factored form before writing answers. For example:

$$\sqrt{8} = \sqrt{4 \cdot 2} = 2\sqrt{2}$$

- L. $2\sqrt{2}$

- I. $3\sqrt{5}$
 A. $5\sqrt{2}$
 T. $2\sqrt{3}$
 O. $7\sqrt{2}$
 S. $4\sqrt{3}$
 E. $5\sqrt{5}$
 A. $2\sqrt{5}$
 S. $6\sqrt{2}$
 Y. $3\sqrt{7}$
 E. 12
 W. $4\sqrt{2}$
 D. $5\sqrt{3}$
 A. $10\sqrt{2}$
 S. $15\sqrt{2}$
 U. $6\sqrt{7}$
 A. $20\sqrt{10}$
 P. 1000
 E. $24\sqrt{2}$
 K. $24\sqrt{3}$
 L. $16\sqrt{5}$
 H. $-9\sqrt{6}$
 A. $-14\sqrt{10}$
 B. -88
 S. $20\sqrt{5}$
 T. $-8\sqrt{6}$
 Z. $15\sqrt{7}$
 C. $30\sqrt{3}$

SHE ALWAYS TALKED ABOUT CAP SIZES

She always talked about cap sizes (capsizes).

Page 205

- $\sqrt{100}$
- $\sqrt{97}$
- $\sqrt{288}$
- $\sqrt{69}$
- $\sqrt{400}$
- $\sqrt{75}$
- $\sqrt{25}$
- $\sqrt{140}$
- $\sqrt{4}$
- $\sqrt{144}$
- $\sqrt{34}$
- $\sqrt{81}$
- $\sqrt{2}$
- $\sqrt{1}$

SHELVES WITH A HIGH POT IN USE (hypotenuse)**Page 206**

- A. $\sqrt{157}$
 B. $\sqrt{105}$
 C. 1 m
- $\sqrt{149}$ cm
- $\sqrt{675}$ cm
- 20 in.
- $\sqrt{336}$ ft
- $\sqrt{7200}$ ft
- $\sqrt{975}$ m

INBEEFLAT

In beef flat (B flat)

Page 207

This puzzle and page 208 are identical, with

one exception. In this puzzle, all variables are assumed to represent nonnegative numbers. On page 208, all radicands, but not all variables, are assumed to be nonnegative. For this puzzle, absolute value bars are not required in answers; they are required for some answers on page 208. Use either puzzle, depending on whether you wish to teach absolute value in this type of exercise.

THEY DONT HAVE THE VEGAS IDEA

They don't have the Vegas (vague)st idea.

Page 208

Please see the note on page 207. Absolute value bars are required for some answers. (Note that absolute value isn't used for x because x can't be negative in this case; if x were negative, the entire radicand would be negative.)

THEY DONT HAVE THE VEGAS IDEA

They don't have the Vegas (vague)st idea.

Page 209

- E. 9
 H. 23
 O. 5
 A. 14
 R. 26
 H. 2
 E. 21
 A. 12
 D. 16
 T. 1
 E. 7
 P. 18
 E. 3
 N. 10
 B. 13
 I. 25
 A. 17
 R. 6
 L. 20
 M. 8
 N. 15
 P. 19
 T. 11
 O. 24
 F. 4
 C. 22

THE FOREMEN TAB AND APPLE CHOIR

The foremen Tab and apple (Mormon Tabernacle) choir

Page 210

- T
- E
- U
- I
- A
- E
- T
- F
- Y
- R
- E
- T
- O
- R
- N
- L
- D
- S
- K
- U

RENT A DUET YOURSELF KIT

Rent a duet yourself (do-it-yourself) kit.

Page 211**THE VERY SAD GUY WHO TRIED TO KISS HIS GIRL FRIEND IN THE FOG AND MIST**

- A. $\frac{5\sqrt{3}}{3}$
 B. $\frac{2\sqrt{7}}{7}$
 C. $4\sqrt{5}$
 D. $7\sqrt{2}$
 E. $\frac{\sqrt{6}}{2}$
 F. $\frac{2\sqrt{10}}{5}$
 G. $\sqrt{11}$
 H. $\frac{\sqrt{3}}{2}$
 I. $5\sqrt{2}$
 J. $\frac{4\sqrt{5}}{5}$
 K. $\frac{3\sqrt{5}}{10}$
 L. $\frac{\sqrt{21}}{3}$
 M. $\frac{\sqrt{2}}{2}$
 N. $3\sqrt{3}$
 O. $\frac{\sqrt{2}}{4}$
 P. $\frac{2\sqrt{5}}{5}$

Page 212

- $3\sqrt{5}$
- $5x^2\sqrt{2}$
- $11\sqrt{3}$
- $4\sqrt{6}$
- $-60\sqrt{2}$
- $2xy\sqrt{5y}$
- $7\sqrt{x+3}/y$
- $\frac{2\sqrt{30}}{5}$
- $\frac{\sqrt{2}}{4}$
- $6n^3\sqrt{n}$
- $-30\sqrt{6}$
- $\frac{4\sqrt{15}}{3}$
- $30n^4\sqrt{7t}$
- $59\sqrt{3}$
- $35\sqrt{11} + 2\sqrt{22}$
- $\frac{\sqrt{6}}{10}$

I DONT KNOW AND I DONT CARE

I don't know, and I don't care.

Page 213

- S. $\frac{\sqrt{21}}{7}$
 E. $\frac{\sqrt{15}}{6}$
 I. $\frac{3\sqrt{5}}{10}$
 O. $\frac{2\sqrt{6}}{9}$
 S. $\frac{3\sqrt{10}}{5}$
 E. $\frac{\sqrt{2}}{2}$
 A. $\sqrt{6}$
 F. $\frac{5\sqrt{3}}{6}$
 R. $\frac{\sqrt{6}}{10}$
 E. 1/2
 T. $\frac{4\sqrt{5}}{5}$
 S. $\frac{\sqrt{15}}{2}$
 M. $\frac{\sqrt{30}}{6}$
 K. $\frac{3\sqrt{30}}{2}$

D. 7**MASTER OF DE SKIES**

Master of de skies (disguise)

Page 214

These exercises are challenging.

1. S
2. U
3. A
4. C
5. E
6. N
7. I
8. B
9. T
10. K
11. L
12. W

IT WASNT A WELL BUCKET

It wasn't a well bucket.

Page 215

1. A HARDENED CRIMINAL
2. CHECKOUT LIONS

1. 23
2. 46
3. -26
4. 4
5. $26 + 11\sqrt{2}$
6. $8 - 4\sqrt{13}$
7. $33 - 9\sqrt{15}$
8. $88 + 18\sqrt{7}$
9. $6\sqrt{3} + 6$
10. $14\sqrt{15} - 10\sqrt{2}$
11. $30\sqrt{5} + 10\sqrt{6}$
12. $36\sqrt{2} - 18\sqrt{10}$
13. $38 + 19\sqrt{5}$
14. $26 - 2\sqrt{7}$
15. $16\sqrt{5}$

Page 216

1. 64
2. 25
3. 24
4. 45
5. 300
6. 16
7. 12
8. 16/5
9. 30
10. 8
11. 17/3
12. no solution; 4 is extraneous
13. 150
14. 27/2
15. 98
16. 11
17. 5
18. 9/4

IT IS A TWIN KEY

It is a twin key (Twinkie).

Page 217

1. 500
2. 24
3. 1/32

4. 4/75
5. 144
6. 7/5
7. 6
8. {1, -4}
9. 5; -2 is extraneous
10. 27/2
11. {3, 4}
12. 2; -7 is extraneous
13. 10; 3 is extraneous
14. 8; -3 is extraneous
15. 16; 1 is extraneous

IT IS BETTER THAN THE OLD CLOUDY KIND

It (new clear physics) is better than the old cloudy kind.

Page 218

THERE ONCE WAS A TEACHER WHO TOLD TEN JOKES TO MAKE THE STUDENTS LAUGH BUT NO PUN IN TEN DID

(no pun intended).

Page 219

1. {-1, 9}
2. {-8, -6}
3. $\{2 \pm 2\sqrt{3}\}$
4. {2, 8}
5. {-4, 10}
6. {-9, 7}
7. $\{9 \pm 2\sqrt{6}\}$
8. $\{-6 \pm 5\sqrt{3}\}$
9. $\{-1/2, 3/2\}$
10. $\left\{\frac{3 \pm \sqrt{7}}{4}\right\}$
11. $\left\{-5 \pm \sqrt{15}\right\}$
12. $\left\{\frac{\pm \sqrt{10}}{2}\right\}$
13. $\left\{\frac{1 \pm \sqrt{6}}{2}\right\}$
14. $\left\{\frac{3 \pm 2\sqrt{5}}{5}\right\}$
15. $\left\{-7 \pm \sqrt{3}\right\}$

APOTPI

A pot pi (pie)

Page 220

1. R
2. N
3. Y
4. C
5. A
6. W
7. U
8. E

9. M
10. F
11. B
12. O
13. T
14. S

BOY SCOUT TENT AFTER A SNOWSTORM

Page 221

1. -1, -3
2. 5, 2
3. -2, -3
4. 4, -1
5. 2, -4
6. $\frac{5 \pm \sqrt{17}}{2}$
7. $\frac{-3 \pm \sqrt{37}}{2}$
8. 2, 1/2
9. 5/2, -1
10. $\frac{-5 \pm \sqrt{13}}{6}$

11. 2, -4/3

TOKEEPCOWSIN

(What is a meadow for?) To keep cows in

Page 222

The exercises in this puzzle include these variations: equations are not given in standard form; the radical term can be simplified; an equation has no solution; reducing is possible in which students must divide *both* parts of the numerator, and the denominator, by a common factor.

- A. 5/2, 1
- N. 3/2, -2
- S. 5/3, -1
- A. $\frac{-7 \pm \sqrt{33}}{2}$
- I. $\frac{-3 \pm \sqrt{69}}{10}$
- G. 2/3, -1/2
- E. $\frac{9 \pm \sqrt{65}}{4}$
- I. $3 \pm \sqrt{5}$
- L. $-2 \pm \sqrt{6}$
- N. $\frac{-5 \pm \sqrt{10}}{3}$
- V. 1, -1/4
- L. no solution
- X. $-1 \pm 2\sqrt{2}$
- I. $\frac{-9 \pm 3\sqrt{5}}{2}$

LIVING IN X AISLE

Living in x aisle (exile)

Page 223

For exercises 1-3, the graph of the function defined by the equation is given. the number of solutions is evident from the graph. For exercises 4-11, students should compute the value of the discriminant to determine the number of solutions.

1. $y = x^2 + 2x - 3$ D
2. $y = x^2 - 4x + 4$ A
3. $y = x^2 - 2x + 2$ O
4. K
5. U
6. A
7. H
8. P
9. N
10. L
11. B

HOLDUPABANK

Hold up a bank.

Page 224

Students need a table of square roots or a calculator with a square root key for this puzzle.

THE CHIROPRACTOR WHO GOT NOTHING BUT BACK TALK

- A. 5 m by 9 m
- B. 6 cm by 18 cm
- C. 4 cm by 7 cm
- D. 7 m
- E. 3.6 m by 5.6 m
- F. 1.5 cm by 7.5 cm
- G. 6.7 m by 10.7 m
- H. 2.7 km by 3.4 km

Page 225

Students need a table of square roots or a calculator with a square root key for this puzzle.

1. 7 cm
2. 6.6 cm
3. 5 m
4. 3.1 m by 5.1 m
5. 8.9 cm
6. 1.2 m
7. 4.5 cm

INSTINCT (In stink)

Page 226

1. E
 2. N
 3. C
 4. A
 5. U
 6. C
 7. E
 8. N
 9. D
 10. H
 11. L
 12. E
 13. P
 14. I
 15. A
 16. S
 17. I
 18. B
 19. M
 20. E
- HE MADE A SCENE IN PUBLIC

Page 227

1. R
2. I
3. E
4. A
5. T
6. S
7. I
8. E
9. R
10. A
11. U
12. I
13. E
14. H
15. F
16. N
17. I
18. W
19. C
20. R
21. L
22. T
23. T
24. B

HE IS A TERRIFIC BUTTER IN LAW

Page 228

- T. 0.4226
- H. 0.7002
- E. 0.9848
- O. 0.1736
- O. 0.9397
- A. 1.000
- W. 0.3420
- O. 35°
- E. 0.2588
- N. 60°
- E. 1.4281
- T. 40°
- D. 0.9962
- W. 65°
- T. 0.5774
- N. 80°
- F. 0.7660
- D. 15°

HE WENT DOWN TO DEFEAT

He went down to defeat (the feet).

Page 229

Students need a table of trigonometric ratios for this puzzle.

- 1. 2.1 m
- 2. 18.5 cm
- 3. 10.9 m
- 4. 6.2 m
- 5. 7.3 cm
- 6. 61.8 m
- 7. 4.7 m
- 8. 16.9 cm
- 9. 22.2 m
- 10. 34.9 mi
- 11. 5.2 m

APARKINSPACE

A park in space (parking space)

Page 230

Students need a table of trigonometric ratios for this puzzle.

YOUR TURN TO BAT
WALL TO WALL
CARPIT

- N. 37°
- U. 21°
- C. 51°
- O. 42°
- Y. 30°
- P. 68°
- A. 5°
- W. 46°
- I. 34°
- L. 9°
- R. 24°
- B. 32°
- T. 2°

Page 231

- 1. ORDERED PAIR
- 2. COORDINATE SYSTEM
- 3. SOLUTION
- 4. GRAPH
- 5. SLOPE
- 6. Y-INTERCEPT
- 7. SLOPE-INTERCEPT FORM
- 8. SYSTEM OF EQUATIONS
- 9. FUNCTION
- 10. DIRECT VARIATION
- 11. INVERSE VARIATION
- 12. RADICAL
- 13. QUADRATIC FORMULA
- 14. PARABOLA

ONLY ON SPECIAL EQUATIONS

Only on special equations (occasions)

Page 232

You may prefer to use these questions one at a time.

- 1. 4
- 2. 44
- 3. No. 32 by 33 —
A-1; B-100;
C-196; D-49;
E-16; F-225;
G-324.
- 4.

37081	or	37091
<u>37081</u>		<u>37091</u>
74126		74182
- 5. 3
- 6. Separate the links from 1 piece and use them to connect the other pieces.
- 7. A: \$13; B: \$7; C: \$4
- 8. Horse racing (by the horses)

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1

2

3

