

# Where Will Campers Sleep in 20 Years ?

Do each exercise below, following the directions given for each section. Select your answer from the two choices given and circle the letter next to it. Write this letter in the box at the bottom of the page that contains the number of that exercise.

Write each expression in exponential form.

①  $x \cdot x \cdot x \cdot x$

Ⓐ  $x^3$

Ⓔ  $x^4$

②  $k$  cubed

Ⓐ  $k^3$

Ⓔ  $k^6$

③  $12 \cdot m \cdot n \cdot n$

Ⓜ  $12mn$

Ⓢ  $12mn^2$

④  $\frac{1}{3} \cdot u \cdot u \cdot u \cdot v \cdot v$

Ⓞ  $uv^2$

Ⓣ  $\frac{1}{3}u^3v^2$

⑤  $(a + b)(a + b)(a + b)$

Ⓔ  $(a + b)^3$

Ⓛ  $a^3 + b^3$

⑥  $(c + d)(c + d)(c - d)$

Ⓐ  $(c - d)^3$

Ⓤ  $(c + d)^2(c - d)$

⑦  $-7 \cdot x \cdot (x + 3)(x + 3)$

Ⓐ  $-21x^3$

Ⓔ  $-7x(x + 3)^2$

⑧  $(x + y)$  squared

Ⓔ  $(x + y)^2$

Ⓛ  $x^2 + y^2$

⑨ the fifth power of the product of  $p$  and  $q$

Ⓛ  $(pq)^5$

Ⓞ  $(p + 5)q$

Evaluate each expression for the given values of the variables.

⑩  $x^2 - 3xy$  if  $x = 5, y = 2$

Ⓣ  $-5$

Ⓔ  $10$

⑪  $x^2 - y^2$  if  $x = -7, y = -1$

Ⓜ  $48$

Ⓔ  $52$

⑫  $(x - y)^3$  if  $x = 2, y = -4$

Ⓐ  $256$

Ⓤ  $216$

⑬  $xy^2 - 2x^3$  if  $x = 3, y = 2$

Ⓕ  $-42$

Ⓟ  $-56$

⑭  $\frac{-5a^2}{a - b}$  if  $a = -4, b = 6$

Ⓔ  $12$

Ⓣ  $8$

⑮  $\frac{3ab^3}{(2a)^2}$  if  $a = 1, b = -2$

Ⓟ  $4$

Ⓣ  $-6$

⑯  $\frac{(a + b)^4}{9 - a^2}$  if  $a = -5, b = 3$

Ⓔ  $2$

Ⓐ  $-1$

9	2	4	11	1	13	6	15	12	7	5	14	8	16	10	3
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# Why Did the Donkey Get a Passport ?



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

- ①  $8x^2 + 2x - 5x + 7$
- ②  $4 - 3x^2 - 9x - 7 + x^2$
- ③  $-5x + 8 - 4x^2 - 4x + 2x^2$
- ④  $x^2 - (-3x) + 4 + 7x^2 - 8x - 6$
- ⑤  $-x - 5x + (-3x^2) - 9 - 2x + 7$
- ⑥  $-7 + x^3 - 5x^2 + 4x - 5x + 3$
- ⑦  $4x^3 + 6x^2 + 6x - 1 + 5x^3 - x^2 - (-9)$
- ⑧  $-7x + 5x^2 - 5x^3 + 8x + 3x^2 - 7x^3 + x^3$
- ⑨  $6x^3 + (-2) - (-2x) - 5x^3 - 4x^2 + x + 4x^2 + 15$
- ⑩  $6x^5 - 2x^4 + 6x^3 - 12x^5 - 6x^4 + 9x^3$
- ⑪  $8ab - 3b^2 + 2a^2 - 4ab + 4b^2$
- ⑫  $5a^2b + 9ab^2 - 2a^2b - 13ab^2$
- ⑬  $3a^3 + b^3 - 6a^2b - a^3 + 6ab^2 + a^2b$
- ⑭  $a^2b^2 + a^2b - a^3 - ab^2 + a^2b - b^3 - a^2b^2 - b^3$

- ①  $-11x^3 + 8x^2 + x$
- ②  $-6x^5 - 7x^4 + 9x^3$
- ③  $8x^2 - 5x - 2$
- ④  $3a^2b - 4ab^2$
- ⑤  $8x^2 - 3x + 7$
- ⑥  $2a^3 - 5a^2b - ab^2 - 2b^3$
- ⑦  $x^3 + 3x + 13$
- ⑧  $x^3 - 5x^2 - x - 4$
- ⑨  $2a^2 + 4ab + b^2$
- ⑩  $-2x^2 - 9x - 3$
- ⑪  $2a^3 - 5a^2b + 6ab^2 + b^3$
- ⑫  $9x^3 + 5x^2 + 6x + 8$
- ⑬  $-2x^2 - 9x + 8$
- ⑭  $-6x^5 - 8x^4 + 15x^3$
- ⑮  $-a^3 + 2a^2b - ab^2 - 2b^3$
- ⑯  $-3x^2 - 8x - 2$

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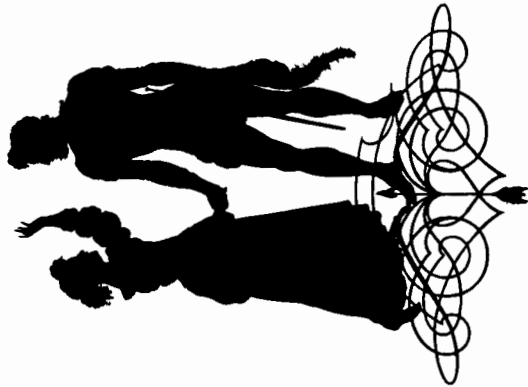


# Daffynition Decoder

1. Romantic: 11 13 8 12 11 1 8 11 13 8 13 10 3 5 12
2. American: 11 2 11 9 9 6 5 7 13 12 11 8 13 3 4

For each exercise below, subtract the second polynomial from the first. 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 “de-fun-itions.”

- ①  $(7x + 4) - (2x + 9)$
- ②  $(3x + 12) - (5x - 6)$
- ③  $(-4x^2 + 10) - (6x^2 - 9)$
- ④  $(2x^2 + 3x + 8) - (x^2 + 5x - 1)$
- ⑤  $(-x^2 + 9x - 2) - (9x^2 - 4x + 4)$
- ⑥  $(3x^2 + 7x + 1) - (8 + 5x + x^2)$
- ⑦  $(4x^3 + 6x^2 - 8x) - (x^3 - 2x^2 + 12x)$
- ⑧  $(x^3 + 2x^2 + 5x) - (3x^2 - x - 7)$
- ⑨  $(x^4 + 8x^2 - 1) - (x^2 - 3x^3 + x^4)$
- ⑩  $(5x^4 - 2x^2) - (3x - 2x^2 - 4x^3 + 6x^4)$
- ⑪  $(3x^2 + 7xy - 2y^2) - (x^2 - 6xy + 2y^2)$
- ⑫  $(-x^2 - 9xy + 5y^2) - (4x^2 - 2xy - y^2)$
- ⑬  $(4x^2y - 3xy^2) - (3x^2y - 8xy^2)$



Answers:

- ① M  $-x^4 + 4x^3 - 7x^2$
- ② S  $-x^4 + 4x^3 - 3x$
- ③ U  $3x^3 + 5x^2 + 7$
- ④ L  $5x - 5$
- ⑤ E  $-10x^2 + 19$
- ⑥ F  $2x^2 + 2x - 19$
- ⑦ C  $-10x^2 + 13x - 6$
- ⑧ H  $-2x + 18$
- ⑨ T  $-5x^2 - 7xy + 6y^2$
- ⑩ O  $3x^3 + 8x^2 - 20x$
- ⑪ P  $3x^3 + 7x^2 - 1$
- ⑫ R  $x^2 - 2x + 9$
- ⑬ A  $2x^2 + 13xy - 4y^2$
- ⑭ N  $x^2y + 5xy^2$
- ⑮ Y  $2x^2 + 2x - 7$
- ⑯ B  $-5x^2 - 6xy + 7y^2$
- ⑰ I  $x^3 - x^2 + 6x + 7$

# WHY ARE MR. AND MRS. NUMBER SO HAPPY?

Find the simplest form for each expression below in the adjacent answer column. The letter of the exercise goes in the box that contains the number of the corresponding answer.

- (E)  $x^3 \cdot x^4$   
 (O)  $3x^2 \cdot x$   
 (T)  $2x^2 \cdot 3x$   
 (I)  $x \cdot x^2 \cdot x^3$   
 (A)  $x^4(-3x^2)$   
 (H)  $(-2x^2)(-2x)$   
 (E)  $x(-x^4)(-x^4)$   
 (19)  $-3x^6$   
 (14)  $3x^3$   
 (25)  $x^9$   
 (7)  $x^7$   
 (10)  $x^6$   
 (2)  $4x^3$   
 (23)  $6x^3$

- (T)  $(u^2v)(-6uv^2)$   
 (E)  $v(uv^2)(u^3v)$   
 (I)  $(4uv)(-u)(2u^4v)$   
 (A)  $(-3u^2)(-u^2v^2)(2uv)$   
 (L)  $(-u^2)(-6u^2v^3)(-u^3v^4)$   
 (G)  $(-2u)(u^2v)(4u^3v^3)$   
 (V)  $(\frac{1}{2}u^2v^3)(2uv^4)$   
 (21)  $-8u^6v^4$   
 (3)  $u^4v^4$   
 (12)  $-8u^6v^2$   
 (17)  $u^3v^7$   
 (5)  $6u^5v^3$   
 (13)  $-6u^3v^3$   
 (24)  $-6u^7v^7$

- (R)  $(ab^2)(a^2b)$   
 (A)  $(3ab)(2a^3b)$   
 (G)  $ab(-4ab^3)$   
 (E)  $(-a^4b)(-5a^2b^3)$   
 (T)  $(-2a^3b)(2ab^3)$   
 (N)  $(6a^2b^2)(-2ab^5)$   
 (O)  $(-4ab^4)(-3ab^4)$   
 (18)  $5a^6b^4$   
 (6)  $a^3b^3$   
 (26)  $12a^2b^8$   
 (8)  $-4a^2b^4$   
 (11)  $-12a^3b^7$   
 (1)  $-4a^4b^4$   
 (16)  $6a^4b^2$

- (L)  $(-b^2)(9a^2b^3)$   
 (Y)  $(3a^2c)(-3bc^2)$   
 (E)  $c(-ab)(a^2b^2c^2)$   
 (O)  $(-3a^2c)(-3b^2c)$   
 (T)  $(-ab)(-b^2c^2)(-a^2b^2)$   
 (H)  $(a^2bc^2)(b^2c^3)(9a)$   
 (N)  $(3b^2)(\frac{1}{3}abc)(-c)$   
 (22)  $-a^3b^5c^2$   
 (27)  $-ab^3c^2$   
 (28)  $-a^3b^3c^3$   
 (15)  $9a^3b^3c^5$   
 (4)  $-9a^2bc^3$   
 (20)  $-9a^2b^5$   
 (9)  $9a^2b^2c^2$

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
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# What Happens to a Dog Who Eats Table Scraps ?



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

- 1  $(x^3)^2$
- 2  $(x^4)^3$
- 3  $(2x^2)^3$
- 4  $(-4x^3)^2$
- 5  $(-3x^4)^3$
- 6  $(8x^5)^2$
- 7  $(-2x^3)^5$
- 8  $(4x)^3$
- 9  $(-9x)^2$
- 10  $x(2x^2)^3$
- 11  $-3x(2x)^2$
- 12  $x^2(5x^3)^3$
- 13  $-4x^2(-4x)^2$

- L  $81x^2$
- T  $125x^{11}$
- S  $-32x^{15}$
- G  $8x^6$
- E  $-64x^4$
- H  $x^6$
- N  $-12x^3$
- S  $64x^{10}$
- E  $x^{12}$
- P  $64x^3$
- E  $16x^6$
- I  $8x^7$
- T  $-27x^{12}$

- 14  $(4a^2b^3)^2$
- 15  $(2a^4b)^3$
- 16  $(-5a^3b^3)^2$
- 17  $(ab^5)^3$
- 18  $(-a^2b^2)^3$
- 19  $(-8ab^4)^2$
- 20  $2a(3a^2b)^2$
- 21  $-b(5a^3b)^3$
- 22  $3ab(2ab^2)^4$
- 23  $(ab^3)^2(a^2b)^3$
- 24  $(-2ab^2)^2(-ab)^3$
- 25  $(3ab^2)(3ab)^2$
- 26  $(-a^2b)^4(-a^2b^4)$

- H  $-a^6b^6$
- E  $-a^{10}b^8$
- R  $16a^4b^6$
- N  $a^8b^9$
- I  $25a^6b^6$
- S  $18a^5b^2$
- U  $27a^3b^4$
- N  $a^3b^{15}$
- I  $64a^2b^8$
- O  $48a^5b^9$
- S  $8a^{12}b^3$
- G  $-4a^5b^7$
- T  $-125a^9b^4$

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
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# What Did the Martian Say When He Accidentally Landed on Venus?

Find the simplest form for each expression in the corresponding answer column. (Some of the expressions cannot be simplified.) Write the letter of the exercise in the box containing the number of your answer.

- (T)  $5x^2 + 2x^2 - 3x^2$
- (N)  $(5x^2)(2x^2)(-3x^2)$
- (S)  $4x^3 + x^2 + 4x$
- (I)  $(4x^3)(x^2)(4x)$
- (L)  $-3x^3 + 5x^2 - 3x^3$
- (A)  $(-3x^3)(5x^2)(-3x^3)$
- (E)  $3x + 2y$
- (T)  $(3x)(2y)$
- (Y)  $7xy^2 - 2xy^2$
- (D)  $(7xy^2)(-2xy^2)$
- (I)  $7x^2y - 2xy^2$
- (A)  $(7x^2y)(-2xy^2)$

- (19)  $5xy^2$
- (1)  $16x^6$
- (11)  $3x + 2y$
- (15)  $7x^2y - 2xy^2$
- (13)  $4x^2$
- (16)  $4x^3 + x^2 + 4x$
- (18)  $45x^8$
- (9)  $-14x^3y^3$
- (5)  $-30x^6$
- (2)  $-14x^2y^4$
- (6)  $6xy$
- (8)  $-6x^3 + 5x^2$

- (I)  $(3a)(a^2)(a^3) + (2a^2)(a^4)$
- (T)  $(a^4)(5a)(a^2) + (-4a^3)(2a^3)(a)$
- (W)  $(2a^3)(a^2)(3a^2) + (8a^2)(-a^2)(a)$
- (D)  $(5a^2)(2ab) + (a^2b)(3a)$
- (H)  $(2ab^2)(-2a^2b^2) - (ab^3)(6a^2b)$
- (N)  $(-a^2b)(ab^2)(a^2b^2) + (a^3b^2)(-a^2b^3)$
- (P)  $(4a^2b^2)(-3b^3) - (2ab^2)(-6ab^3)$

- (10)  $-2a^5b^5$
- (4)  $13a^3b$
- (12)  $-3a^7$
- (7) 0
- (14)  $-10a^3b^4$
- (3)  $5a^6$
- (17)  $6a^7 - 8a^5$



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
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# Why Couldn't the Chicken Find Her Egg?

Simplify each expression and find your answer below. Cross out the box containing your answer. When you finish, there will be six boxes not crossed out. Print the letters from these boxes in the squares at the bottom of the page.



- |                         |                       |                                 |
|-------------------------|-----------------------|---------------------------------|
| ① $(4x^2y)(2xy^2)$      | ⑦ $(4xy^2)(x^3y)^2$   | ⑬ $(-1)^3(5x^2y)^3$             |
| ② $x^2(3xy)(xy^4)$      | ⑧ $(-x^4y)(3xy^3)^2$  | ⑭ $(2x)^4(-x^2)(-y)^2$          |
| ③ $(-4x^3y)(x^2y^2)(y)$ | ⑨ $(5x^2y)^2(2xy^3)$  | ⑮ $(-3x^2y^2)(-3xy)^2$          |
| ④ $(5xy^3)^2$           | ⑩ $(-xy)^2(-xy^2)$    | ⑯ $(7x^6y^4)(x^3y^2)^2$         |
| ⑤ $(-3x^2y)^3$          | ⑪ $3(x^2y)^2(xy^2)^4$ | ⑰ $7x^6y^4 + (x^3y^2)^2$        |
| ⑥ $(6x^2)(2x)^3$        | ⑫ $(-2x^2)^3(-y)^5$   | ⑱ $x^2(xy^3)^2 + y^2(x^2y^2)^2$ |

IT	TH	SH	EL	EE	OW	EM	IX
$-4x^5y^4$	$7x^{12}y^8$	$7x^{10}y^9$	$-x^3y^4$	$2x^4y^6$	$8x^3y^3$	$16x^4y^3$	$3x^8y^{10}$
GG	IS	OS	YO	AT	LK	LA	TE
$8x^6y^4$	$-4x^6y^3$	$50x^5y^5$	$48x^5$	$8x^6y^5$	$4x^7y^4$	$4x^6y^6$	$-125x^6y^3$
SD	TH	ID	LO	QU	IT	ST	EN
$25x^2y^6$	$-9x^6y^7$	$-x^5y^8$	$-27x^4y^4$	$3x^4y^5$	$3x^7y^{12}$	$-16x^6y^2$	$-27x^6y^3$
							



# What Happened to the Man Who Invested in a Paper Towel Company and a Revolving Door Factory?

Simplify each expression. Find the answer below 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.

- |   |   |
|---|---|
| <p>1 <math>7x^2 + 3x - x^2</math></p> <p>2 <math>(7x^2)(3x)(-x^2)</math></p> <p>3 <math>(-2x^3)(5x)(-8x^4)</math></p> <p>4 <math>x(3x^2)^3</math></p> <p>5 <math>-4x(-5x)^2</math></p> <p>6 <math>(2x^4)(-6x^3) + (9x)(3x^6)</math></p> | <p>7 <math>a^2 + b + a^2 + b^2 + b</math></p> <p>8 <math>(-2a^3b)^4</math></p> <p>9 <math>a^2(6a^3b)(ab^5)</math></p> <p>10 <math>(4ab^3)(-5b^6)(2a^2)</math></p> <p>11 <math>(3a^4b)(5ab^2) - (a^5b^2)(9b)</math></p> <p>12 <math>(7a^2b^2)^2 + (ab)^4 - 50</math></p> |
|---|---|

- |   |   |
|---|---|
| <p>Answers:</p> <p>IN <math>80x^{11}</math> OR <math>-100x^3</math></p> <p>SW <math>27x^7</math> ED <math>6x^2 + 3x</math></p> <p>EC <math>-21x^5</math> LA <math>36x^7</math></p> <p>HE <math>15x^7</math> OU <math>80x^8</math></p> | <p>Answers:</p> <p>OU <math>6a^6b^6</math> LD <math>2a^2 + b^2 + 2b</math></p> <p>ER <math>6a^7b^4</math> RN <math>-40a^3b^9</math></p> <p>TB <math>16a^{12}b^4</math> ND <math>50a^4b^4 - 50</math></p> <p>EH <math>6a^5b^3</math> TO <math>-40a^4b^6</math></p> |
|---|---|

- |  |  |
|--|--|
| <p>13 <math>(8x^2y)(x^4y^3)^2</math></p> <p>14 <math>2x(-5y^6)^3</math></p> <p>15 <math>(xy^2)^3(x^2y)^2 + (x^3y^4)(x^2y^2)^2</math></p> <p>16 <math>(-x^2)^5(-2x^2y^3)^3</math></p> <p>17 <math>(4xy^7)(2x^4y) - (5x^3y^3)(-8x^2y^5)</math></p> <p>18 <math>(3x^2)(3y^2) + 3x^2y - (3xy)^2 - 3xy^2</math></p> | <p>Answers:</p> <p>SO <math>18x^6y^9</math> TU <math>48x^5y^8</math></p> <p>WA <math>8x^{10}y^7</math> EF <math>-250xy^{18}</math></p> <p>HA <math>8x^{12}y^8</math> IP <math>3x^2y - 3xy^2</math></p> <p>AR <math>2x^7y^8</math> OU <math>8x^{16}y^9</math></p> |
|--|--|

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

# What Did the Girl Mushroom Say About the Boy Mushroom After Their First Date ?



- ①  $5(2n^2 + n)$
- ②  $3n(8n^2 - 2n)$
- ③  $n^2(4n - 3)$
- ④  $-2n(4 + 5n^3)$
- ⑤  $-6n^2(4n^2 - 9)$

Answers:

- ① B  $-24n^4 - 54n$
- ② T  $24n^3 - 4n$
- ③ R  $-24n^4 + 54n^2$
- ④ U  $4n^3 - 3n^2$
- ⑤ S  $10n^2 + 5n$
- ⑥ L  $24n^3 - 6n^2$
- ⑦ O  $-8n - 6n^3$
- ⑧ A  $-8n - 10n^4$

For each exercise below, multiply the polynomial by the monomial. Find your answer in the set of answers under the exercise and notice the letter next to it. Write this letter in the box that contains the number of that exercise.



- ① N  $x^2y(2x^2 - 4xy + y^2)$
- ② S  $-2xy^2(2x^4 - 5x^2y^2 - 3y^4)$
- ③ E  $4x^3y(-x^2y + 2xy - 5xy^2)$
- ④ U  $-x^2y^3(7xy^3 - x^2y^2 + 3x^3y)$
- ⑤ Y  $3x^2y^2(2x^4y^2 - 3x^2y - 1)$

Answers:

- ① N  $-4x^5y^2 + 10x^3y^4 + 6xy^6$
- ② S  $2x^4y - 4x^2y^3 + x^2y^4$
- ③ E  $-4x^5y^2 + 8x^4y^2 - 20x^4y^3$
- ④ U  $-4x^5y^2 + 10x^2y^4 - 20x^2y^3$
- ⑤ Y  $2x^4y - 4x^3y^2 + x^2y^3$
- ⑥ F  $6x^6y^4 - 9x^4y^3 - 3x^2y^2$
- ⑦ T  $-7x^3y^6 + x^5y^4 - 3x^3y^4$
- ⑧ I  $-7x^3y^6 + x^4y^5 - 3x^5y^4$

- ⑥ G  $4a(a^2 - 2a + 3)$
- ⑦ H  $-2a^2(9 - a - 4a^2)$
- ⑧ A  $a^2b(a^2 - b^2)$
- ⑨ E  $-3ab^2(a^3b^2 - 2a^2b)$
- ⑩ L  $2ab(a^2 + 4ab - 3b^2)$

Answers:

- ① M  $4a^3 - 8a^2 + 10$
- ② H  $-18a^2 + 2a^3 + 8a^4$
- ③ E  $2a^3b + 8a^2b^2 - 6ab^3$
- ④ I  $2a^3b + 8ab^2 - 4ab$
- ⑤ A  $a^4b - a^2b^3$
- ⑥ G  $4a^3 - 8a^2 + 12a$
- ⑦ W  $-18a^2 + 2a^3 + 6a^5$
- ⑧ L  $-3a^4b^4 + 6a^3b^3$

7	10	1	5	13	4	9	2	11	8	15	3	12	6	14
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# Why Is a Stick of Gum Like a Sneeze?

For each exercise, multiply the two polynomials. Find your answer in the set of answers under the exercise. Cross out the letter above your answer. When you finish, the answer to the title question will remain!

- 1  $(x + 3)(x + 5)$
- 2  $(x + 2)(x + 9)$
- 3  $(x - 8)(x + 1)$
- 4  $(x - 3)(x - 6)$
- 5  $(2x + 9)(x - 2)$
- 6  $(3x + 1)(2x + 4)$

- 7  $(4a - 7)(3a - 2)$
- 8  $(2a + 5)(2a - 5)$
- 9  $(6a - 1)(2a + 4)$
- 10  $(a + 2b)(4a + b)$
- 11  $(5a + 3b)(a - 4b)$
- 12  $(3a - 8b)(2a - b)$

- 13  $(n + 2)(n^2 + 5n - 3)$
- 14  $(3n - 1)(2n^2 + 4n + 4)$
- 15  $(2n + 3)(6n^2 - 2n + 1)$
- 16  $(4n - 5)(n^2 - 7n - 2)$
- 17  $(3n - 4)(4n^2 + 2n + 3)$
- 18  $(n + 8)(6n^2 - n - 4)$

B	E	S	I	A	U	T	N	T	I	S	E	R	A	N	O	T	C	R	I	H	E	A	N	W	D
$x^2 - 7x - 8$	$x^2 + 8x + 15$	$6x^2 + 14x + 4$	$6x^2 + 7x + 4$	$x^2 - 9x + 18$	$x^2 + 11x + 18$	$x^2 - 13x + 18$	$2x^2 + 5x - 18$	$4a^2 + 9ab + 2b^2$	$6a^2 - 19ab + 8b^2$	$5a^2 - 11ab - 12b^2$	$12a^2 + 22a - 4$	$4a^2 - 25$	$4a^2 + 4ab + 3b^2$	$5a^2 - 17ab - 12b^2$	$12a^2 - 29a + 14$	$6n^3 + 47n^2 - 12n - 32$	$6n^3 + 44n^2 - 9n - 32$	$4n^3 - 33n^2 + 27n + 10$	$6n^3 + 10n^2 + 8n - 4$	$n^3 + 6n^2 + 9n - 6$	$12n^3 - 9n^2 - 2n - 12$	$12n^3 - 10n^2 + n - 12$	$n^3 + 7n^2 + 7n - 6$	$4n^3 - 30n^2 + 21n + 10$	$12n^3 + 14n^2 - 4n + 3$



# Where Can You See the World's Biggest Rock Group?

Evaluate each formula below for the given values of the variables. Find each answer at the bottom of the page and cross out the letters above it. When you finish, the answer to the title question will remain.

①  $V = hw^2$

where  $V$  is the volume of a square prism with a square base of side  $w$  and with height  $h$ . Find  $V$  if

$h = 8 \text{ cm}, w = 6 \text{ cm}.$  \_\_\_\_\_  $\text{cm}^3$

②  $A = \frac{1}{2}h(a + b)$

where  $A$  is the area of a trapezoid with height  $h$ , and bases of lengths  $a$  and  $b$ . Find  $A$  if

$h = 12 \text{ cm}, a = 24 \text{ cm}, b = 18 \text{ cm}.$  \_\_\_\_\_  $\text{cm}^2$

③  $V = C\left(1 - \frac{n}{N}\right)$

where  $V$  is the value of an asset, depreciated over  $N$  years, at the end of  $n$  years;  $C$  is the original cost of the asset. Find  $V$  if

$C = \$800, n = 5 \text{ years}, N = 20 \text{ years}.$  \$ \_\_\_\_\_

④  $h = rt - 4.9t^2$

where  $h$  is the height in meters that an object will reach in  $t$  seconds when it is projected upward with an initial speed of  $r$  meters per second. Find  $h$  if

$r = 75 \text{ m/sec}, t = 10 \text{ sec}.$  \_\_\_\_\_  $\text{m}$

⑤  $w = 0.8e^3$

where  $w$  is the approximate weight in grams of an ice cube with edges of length  $e$  centimeters. Find  $w$  if

$e = 5 \text{ cm}.$  \_\_\_\_\_  $\text{g}$

⑥  $R = \frac{rst}{rs + st + rt}$

where  $R$  is the total resistance of three resistances  $r, s,$  and  $t,$  in parallel. Find  $R$  if

$r = 4 \text{ ohms}, s = 10 \text{ ohms}, t = 15 \text{ ohms}.$  \_\_\_\_\_  $\text{ohms}$

⑦  $V = \frac{1}{3}\pi r^2 h$

where  $V$  is the volume of a right circular cone with a base of radius  $r$  and with height  $h$ . Find  $V$  if

$r = 6 \text{ cm}, h = 10 \text{ cm}.$   
Use 3.14 as the value of  $\pi$ . \_\_\_\_\_  $\text{cm}^3$

GE	MT	TA	OP	RU	ST	IN	SH	MO	FI	VE	RE
260	4.5	288	376.8	112	600	2.4	341.5	275	252	100	628

# What Should You Do If Your Lawn Is Always Dry ?

Solve each formula below for the indicated letter. Circle the letter next to your answer. Write this letter in the box at the bottom of the page that contains the number of that exercise.

$A = \ell w$ , for $\ell$ (O) $\ell = \frac{A}{w}$ (K) $\ell = \frac{w}{A}$ ①	$S = 2\pi rh$ , for $h$ (I) $h = \frac{S}{2\pi r}$ (O) $h = \frac{2\pi r}{S}$ ⑤	$E = mc^2$ , for $m$ (K) $m = Ec^2$ (T) $m = \frac{E}{c^2}$ ⑨	$S = 2B + F$ , for $B$ (S) $B = \frac{S - F}{2}$ (N) $B = 2SF$ ⑬	$T = \frac{rhdg}{2}$ , for $d$ (R) $d = \frac{rhg}{2T}$ (L) $d = \frac{2T}{rhg}$ ⑰															
$E = IR$ , for $R$ (V) $R = EI$ (I) $R = \frac{E}{I}$ ②	$V = T - F$ , for $T$ (R) $T = \frac{F}{V}$ (E) $T = V + F$ ⑥	$S = \frac{1}{2}at^2$ , for $a$ (S) $a = \frac{t^2}{2S}$ (B) $a = \frac{2S}{t^2}$ ⑩	$A = p + prt$ , for $t$ (T) $t = \frac{A - p}{pr}$ (M) $t = \frac{p + r}{Ap}$ ⑭	$y = mx + b$ , for $m$ (K) $m = \frac{y - b}{x}$ (B) $m = \frac{y - x}{b}$ ⑱															
$l = prt$ , for $r$ (X) $r = \frac{lp}{t}$ (U) $r = \frac{l}{pt}$ ③	$A = \frac{1}{2}bh$ , for $h$ (F) $h = \frac{2A}{b}$ (T) $h = \frac{Ab}{2}$ ⑦	$A = \pi r^2$ , for $r^2$ (U) $r^2 = \frac{A}{\pi}$ (E) $r^2 = A\pi$ ⑪	$p = 2\ell + 2w$ , for $w$ (Y) $w = \frac{p - 2\ell}{2}$ (P) $w = \frac{p + \ell}{2}$ ⑮	$F = \frac{9}{5}C + 32$ , for $C$ (N) $C = \frac{5}{9}F + 32$ (R) $C = \frac{5}{9}(F - 32)$ ⑲															
$V = \ell wh$ , for $\ell$ (A) $\ell = \frac{Vw}{h}$ (E) $\ell = \frac{V}{wh}$ ④	$V = \frac{1}{3}Bh$ , for $B$ (A) $B = \frac{3V}{h}$ (I) $B = 3Vh$ ⑧	$E = \frac{1}{2}mv^2$ , for $v^2$ (Y) $v^2 = \frac{2E}{m}$ (G) $v^2 = \frac{2m}{E}$ ⑫	$V = \frac{1}{3}\pi r^2 h$ , for $h$ (T) $h = \frac{3r^2}{\pi V}$ (W) $h = \frac{3V}{\pi r^2}$ ⑯	$V = \frac{4}{3}\pi r^3$ , for $r^3$ (N) $r^3 = \frac{4V\pi}{3}$ (D) $r^3 = \frac{3V}{4\pi}$ ⑳															
10	3	12	8	20	6	16	5	9	15	1	11	19	13	4	17	7	18	2	14

# \* How Did the Doe Win the Big Animal Race? \*

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

- ① Mr. Merrill has 3 times as many nickels as dimes. The coins have a total value of \$1.50. How many of each coin does he have? \_\_\_\_\_ nickels, \_\_\_\_\_ dimes
- ② Ms. Lynch has 21 coins in nickels and dimes. Their total value is \$1.65. How many of each coin does she have? \_\_\_\_\_ nickels, \_\_\_\_\_ dimes
- ③ A vending machine that takes only dimes and quarters contains 30 coins, with a total value of \$4.20. How many of each coin are there? \_\_\_\_\_ dimes, \_\_\_\_\_ quarters
- ④ The total value of the \$1 bills and \$5 bills in a cash box is \$124. There are 8 more \$5 bills than \$1 bills. How many of each are there? \_\_\_\_\_ \$1 bills, \_\_\_\_\_ \$5 bills
- ⑤ A collection of nickels and quarters amounts to \$2.60. There are 16 coins in all. How many of each coin are there? \_\_\_\_\_ nickels, \_\_\_\_\_ quarters
- ⑥ Joe Lick bought some 20-cent and 25-cent stamps. He bought 32 stamps in all, and paid \$7.40 for them. How many stamps of each kind did he buy? \_\_\_\_\_ 20-cent, \_\_\_\_\_ 25-cent
- ⑦ For a school play, 340 tickets valued at \$810 were sold. Some cost \$2 and some cost \$3. How many tickets of each kind were sold? \_\_\_\_\_ \$2 tickets, \_\_\_\_\_ \$3 tickets
- ⑧ Romeo bought a mixture of 20-cent, 35-cent, and 50-cent valentines. The number of 20-cent valentines was 1 more than twice the number of 35-cent valentines, and the number of 50-cent valentines was 2 less than the number of 35-cent ones. If he spent \$4.20 all together, how many valentines of each kind did he buy? \_\_\_\_\_ 20-cent, \_\_\_\_\_ 35-cent, \_\_\_\_\_ 50-cent

IT 22, 8	SH 6, 10	ER 7, 9	EW 9, 4, 2	EP 13, 6, 4	ON 18, 6	AN 14, 22	AS 240, 100
SE 19, 11	DT 13, 21	EN 210, 130	HE 8, 13	BU 200, 140	KI 12, 20	CK 11, 21	LL 9, 12

# What Kind of Car Does a Rich Baker Drive ?

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

- 1 Harry and Kerry started from the same point at the same time. They traveled in opposite directions on their bicycles. Harry traveled at the rate of 9 km/h, and Kerry traveled at 11 km/h. After how many hours were they 60 km apart?
- 2 Two trains leave Trackville at the same time. One travels north at 90 km/h. The other travels south at 110 km/h. After how many hours will the trains be 900 km apart?
- 3 Two steamships sailing in opposite directions pass each other. One ship is sailing at 32 knots (nautical miles per hour). The other ship is sailing at 28 knots. After how many hours will the ships be 150 nautical miles apart?
- 4 Two jets are traveling toward each other and are 3400 km apart. One jet is flying at 875 km/h. The other jet is flying at 825 km/h. In how many hours will the jets pass each other?
- 5 A train left Podunk and traveled west at 70 km/h. Two hours later, another train left Podunk and traveled east at 90 km/h. How many hours had the first train traveled when they were 1420 km apart?
- 6 A train left Podunk and traveled north at 75 km/h. Two hours later, another train left Podunk and traveled in the same direction at 100 km/h. How many hours had the first train traveled when the second train overtook it?
- 7 Joe Spout left a campsite on a trip down the river in a canoe, traveling at 6 km/h. Four hours later, Joe's father set out after him in a motorboat. The motorboat traveled at 30 km/h. How long after Joe's father started did he overtake the canoe?
- 8 In Exercise 7, how far had Joe traveled down the river when his father overtook him?

AB	AN	IG	ON	IT	OP	IO
30 km	44 km	8 h	$5\frac{1}{3}$ h	2 h	3 h	14 h
NR	BR	OL	WH	EE	LS	AD
$7\frac{1}{2}$ h	1 h	13 h	$4\frac{1}{2}$ h	10 h	22 km	$2\frac{1}{2}$ h



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# What Do the Fans Sing at University of California Football Games?

Solve each problem below and find your solution at the bottom of the page. Write the letter of that exercise above the solution.

- (A) Two trucks left Buck's Trucks traveling in opposite directions. One truck traveled at a rate of 70 km/h, the other at 80 km/h. After how many hours were the trucks 900 km apart?
- (Y) Two jets are traveling toward each other and are 4000 km apart. The rate of one jet is 100 km/h faster than the rate of the other. If the jets pass each other after 2.5 hours, what is the rate of the faster jet?
- (O) A truck left Huck's Trucks and traveled north at 80 km/h. One hour later, another truck left Huck's Trucks and traveled south at 60 km/h. How many hours had the first truck traveled when they were 150 km apart?
- (S) Ms. Driva Reck drove from her home to a service station at 48 km/h. She returned home by bicycle at 16 km/h. The entire trip took 4 hours. How far was the service station from Ms. Reck's home?
- (N) Steve McSpoke left home on his bicycle at 8:00 A.M., traveling at 18 km/h. At 10:00 A.M., Steve's brother set out after him on a motorcycle, following the same route. The motorcycle traveled at 54 km/h. How long had Steve traveled when his brother overtook him?
- (U) A plane on a search mission flew east from an airport, turned, and flew west back to the airport. The plane cruised at 300 km/h when flying east, and 400 km/h when flying west. The plane was in the air for 7 hours. How far from the airport did the plane travel?
- (C) In Exercise N, how far had Steve traveled when his brother overtook him?
- (C) A motorboat can travel upstream on a river at 18 km/h and downstream at 30 km/h. How far upstream can the boat travel if it leaves at 8:00 A.M. and must return by noon?
- (A) Dr. Pepper left Oakville at 9:00 A.M. and drove to Central City at 60 km/h. H. Salt left Oakville at 11:00 A.M. and traveled the same route to Central City. If both men arrived in Central City at 4:00 P.M., at what rate did H. Salt travel?



1.5	74	48	6	850	4.5	45	84	3	610	1200	54	
h	km	km	h	km/h	h	km	km/h	h	km/h	km	km	

# Why Are Babies Like Hinges ?

Simplify each expression below and find your answer in the set of answers to the right of that exercise. Write the letter of your answer in the box that contains the number of that exercise.

①  $\frac{n^9}{n^5}$

③  $\frac{2n^4}{n}$

Ⓐ  $2n^6$

Ⓔ  $2n^3$

②  $\frac{n^{12}}{n^3}$

④  $\frac{6n^2}{3n^5}$

Ⓕ  $n^9$

Ⓙ  $n^4$

Ⓖ  $\frac{2}{n^6}$

Ⓨ  $\frac{2}{n^3}$

⑤  $\frac{x^3y^4}{x^2y}$

⑦  $\frac{8xy^2}{12x^3y^5}$

Ⓖ  $-4x^3$

Ⓐ  $xy^3$

Ⓢ  $-4y^4$

Ⓣ  $-4y^7$

⑥  $\frac{-8x^6y^2}{2x^3y^2}$

⑧  $\frac{20x^3y^8}{-5x^3y}$

Ⓔ  $\frac{2}{3x^2y^3}$

Ⓤ  $\frac{2}{3xy^4}$

⑨  $\frac{3a^5b^2}{9a^2b^5}$

⑪  $\frac{-24a^2b}{18ab^5}$

Ⓡ  $5ab^8$

Ⓐ  $15a^2$

Ⓛ  $5ab^6$

Ⓖ  $15a^3$

⑩  $\frac{-15a^2b^9}{-3ab}$

⑫  $\frac{30a^9b^2}{2a^6b^2}$

Ⓝ  $-\frac{4a}{3b^4}$

Ⓕ  $\frac{a^3}{3b^3}$

⑬  $\frac{8u^4v^{10}}{-2u^2v^8}$

⑮  $\frac{-7u^2v^6}{uv^3}$

Ⓑ  $-7uv^5$

Ⓢ  $-4u^2v^2$

Ⓞ  $-7uv^3$

Ⓔ  $-4u^7v^2$

⑭  $\frac{13u^7v^7}{26u^7v}$

⑯  $\frac{-9u^8v^2}{-6u^2v^6}$

Ⓣ  $\frac{v^6}{2}$

Ⓐ  $\frac{3u^6}{2v^4}$

⑰  $\frac{14k^9m^3}{2km^3}$

⑲  $\frac{-3k^5m^6}{k^4m^3}$

Ⓔ  $-3k$

Ⓛ  $7k^6m$

Ⓓ  $7k^8$

Ⓖ  $-3km^3$

⑱  $\frac{4k^2m^2}{16k^5m^3}$

⑳  $\frac{12km^3}{-4m^3}$

Ⓞ  $\frac{1}{4k^3m}$

Ⓝ  $\frac{1}{4km^2}$

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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# Why Was the Engineer Driving the Train Backwards ?



Find the missing factor in each exercise below. Find your answer in the set of answers to the right of that exercise. Write the letter next to your answer in the box containing the number of that exercise.

①  $x^8 = (x^5)(\underline{\hspace{2cm}})$

Ⓓ  $4x^5$

⒩  $x^6$

②  $24x^5 = (6x^2)(\underline{\hspace{2cm}})$

Ⓐ  $-5x^5$

Ⓞ  $4x^3$

③  $-12x^4 = (3x^3)(\underline{\hspace{2cm}})$

Ⓗ  $x^3$

Ⓡ  $-4x^8$

④  $20x^7 = (-4x^2)(\underline{\hspace{2cm}})$

Ⓔ  $-5x^3$

Ⓜ  $-4x$

⑤  $a^5b^8 = (a^2b^3)(\underline{\hspace{2cm}})$

Ⓟ  $a^2b^2$

Ⓔ  $a^3b^5$

⑥  $4a^2b^6 = (2ab^2)(\underline{\hspace{2cm}})$

Ⓥ  $5a^3b^3$

Ⓐ  $-12a^2b^4$

⑦  $-15a^7b^4 = (-3a^4b)(\underline{\hspace{2cm}})$

Ⓛ  $2ab^7$

Ⓗ  $-12a^5b$

⑧  $72a^{10}b^3 = (-6a^5b^2)(\underline{\hspace{2cm}})$

Ⓞ  $2ab^4$

Ⓚ  $5a^5b^3$

⑨  $x^5y^3 = (x^2)(\underline{\hspace{2cm}})$

Ⓥ  $-3y^4$

Ⓞ  $3x^2y^6$

⑩  $-6x^2y^7 = (-2y)(\underline{\hspace{2cm}})$

Ⓛ  $-2x^7$

Ⓣ  $3x^2y^3$

⑪  $14x^9y^6 = (-7x^2y^6)(\underline{\hspace{2cm}})$

Ⓢ  $-2x^6y$

Ⓐ  $x^3y^3$

⑫  $27x^4y^3 = (9x^4y)(\underline{\hspace{2cm}})$

Ⓑ  $x^2y^4$

Ⓔ  $3y^2$

⑬  $-3u^4v^2 = (u^2v)(\underline{\hspace{2cm}})$

Ⓡ  $-2uv^6$

Ⓡ  $-3u^2v^4$

⑭  $32uv^5 = (-16v^2)(\underline{\hspace{2cm}})$

Ⓜ  $11v^2$

Ⓒ  $-3u^2v^{11}$

⑮  $121u^2v^3 = (11u^2v)(\underline{\hspace{2cm}})$

Ⓟ  $11uv^3$

Ⓔ  $3u^2v^6$

⑯  $-6u^3v^{12} = (2uv)(\underline{\hspace{2cm}})$

Ⓣ  $-3u^2v$

Ⓓ  $-2uv^3$

8	12	1	9	14	4	11	2	16	6	15	10	13	3	7	5
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# Why Did Everybody Go to the Boat Show?

Each row across has five boxes. Only two of them contain FACTORS of the given monomial. Circle these two factors in each row. Notice the number and letter above each circled factor. Put the letter in the matching numbered box at the bottom of the page.

1	$8n^4$	14-J	10-H	18-P	15-F	4-C											
		$4n^5$	$2n$	$16n$	$-4n^3$	$-8n^8$											
2	$6x^2y^3$	2-B	4-A	18-S	8-N	14-O											
		$2x^3y$	$-6xy$	$-2y^4$	$12x^2y$	$3x^2y^2$											
3	$24a^4b$	5-E	13-V	2-T	18-R	8-L											
		$-2ab^2$	$18a^2b$	$-12ab$	$a^3b$	$8a^8b$											
4	$-4u^2v^4$	8-A	1-R	17-L	6-M	5-D											
		$2u^2v^4$	$-2u^4v$	$4uv^8$	$12uv$	$-4uv^3$											
5	$10pq^5$	9-U	17-B	13-O	12-S	1-I											
		$20q$	$5p^2q$	$pq^2$	$-10pq^7$	$-2pq^3$											
6	$-72k^2w^2$	3-D	6-A	17-E	12-L	9-V											
		$kw^4$	$24k^2w^2$	$-8w^2$	$-4k^4$	$32kw$											
7	$-30mn^{10}$	3-P	12-T	16-P	9-C	11-E											
		$-10m^5$	$30m$	$-3m^2n^2$	$-6mn^5$	$4mn$											
8	$9xy^2z^6$	16-F	7-P	16-T	11-S	3-H											
		$-3xyz$	$x^2y^2z^2$	$-3yz^{12}$	$3xy^4z$	$9xy^2z^3$											
9	$-18a^3bc^3$	11-S	7-W	11-T	10-E	7-Y											
		$12abc$	$2ab^2c$	$-abc^3$	$-3a^6bc$	$9bc^2$											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

# Where Do Tadpoles in the Pawn Shop Come From ?

Factor each polynomial below as the product of its greatest monomial factor and another polynomial. Find your answer and notice the letter next to it. Write this letter in each box that contains the number of that exercise.

- ①  $3x^2 + 18x + 9$   
 ②  $2x^2 + 10x + 12$   
 ③  $7x^2 + 14x + 35$   
 ④  $5x^2 - 20x + 10$   
 ⑤  $6x^2 + 9x - 21$

Answers:

- ④  $3(2x^2 + 3x - 7)$   
 ④  $3(2x^2 + 4x - 5)$   
 ④  $3(x^2 + 6x + 3)$   
 ④  $5(x^2 - 2x + 5)$   
 ④  $5(x^2 - 4x + 2)$   
 ④  $2(x^2 + 5x + 6)$   
 ④  $7(x^2 + x + 6)$   
 ④  $7(x^2 + 2x + 5)$

- ⑥  $n^3 + n^2 + n$   
 ⑦  $n^4 - n^3 + n^2$   
 ⑧  $2n^3 - n^2 - 5n$   
 ⑨  $3n^2 + 9n$   
 ⑩  $7n^2 - 28n$

Answers:

- ④  $n(2n^2 - 2n - 6)$   
 ④  $n^2(n^2 - n + 1)$   
 ④  $7n(n + 5)$   
 ④  $3n(n + 3)$   
 ④  $n^2(n^2 - 2n + 3)$   
 ④  $n(n^2 + n + 1)$   
 ④  $n(2n^2 - n - 5)$   
 ④  $7n(n - 4)$

- ⑪  $4k^3 - 32k$   
 ⑫  $6k^3 + 10k^2$   
 ⑬  $5k^3 + 15k^2 + 10k$   
 ⑭  $4k^3 - 20k^2 + 4$   
 ⑮  $4k^4 + 18k^3 - 6k^2$

Answers:

- ④  $4(k^3 - 5k^2 + 1)$   
 ④  $5k(k^2 + 3k + 2)$   
 ④  $4(k^3 - 8k^2 + 2)$   
 ④  $4k(k^2 - 8)$   
 ④  $5k(k^2 + 4k + 1)$   
 ④  $2k^2(2k^2 + 9k - 3)$   
 ④  $2k^2(3k - 9)$   
 ④  $2k^2(3k + 5)$

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

1. What do you get when you cross a chicken with a centipede?

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

2. What do you get when you cross a mink with an octopus?

12   7   3   12   11   3   9   12   14   10   13

Factor each polynomial below as the product of its greatest monomial factor and another polynomial. 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 find out what you get from these "double crosses."

- ①  $6x^2 + 9x + 27$
- ②  $5x^3 + 30x^2 - 15x$
- ③  $14x^3 - 7x^2 - 35x$
- ④  $25x^3 - 40x^2 + 10x$
- ⑤  $4x^4 + 20x^3 + 12x^2$
- ⑥  $3x^4 + 12x^2 - 33$
- ⑦  $49x^4 - 14x^3 - 28x$

Answers:

- Ⓔ  $4x^2(x^2 + 5x + 3)$
- Ⓕ  $3(x^4 + 6x^2 + 11)$
- Ⓞ  $7x(2x^2 - x - 5)$
- Ⓤ  $3(2x^2 + 3x + 9)$
- Ⓒ  $7x(7x^3 - 2x^2 - 4)$
- Ⓚ  $5x(5x^2 - 8x + 2)$
- Ⓑ  $7x(7x^3 + 2x^2 - 3)$
- Ⓓ  $5x(x^2 + 6x - 3)$
- Ⓘ  $3(x^4 + 4x^2 - 11)$

- ⑧  $2a^2 + 12ab + 6b^2$
- ⑨  $6a^3 - 18ab$
- ⑩  $3a^2b^2 + 15ab^3$
- ⑪  $8a^4b^4 - 28a^3b^3 + 4a^2b^2$
- ⑫  $6a^4b - 10a^3b^2 - 6a^2b^3$
- ⑬  $7ab^5 - 56ab$
- ⑭  $24ab^4 + 12ab^3 - 18ab^2$

Answers:

- ⒣  $6ab^2(4b^2 - 3b - 2)$
- ⓧ  $2(a^2 + 6ab + 3b^2)$
- Ⓢ  $7ab(b^4 - 8)$
- Ⓜ  $3ab^2(a + 5b)$
- Ⓓ  $6ab^2(4b^2 + 2b - 3)$
- Ⓝ  $4a^2b^2(2a^2b^2 - 9ab + 2)$
- Ⓐ  $2a^2b(3a^2 - 5ab - 3b^2)$
- Ⓕ  $6a(a^2 - 3b)$
- Ⓗ  $4a^2b^2(2a^2b^2 - 7ab + 1)$

# What Did They Say About the Man Who Drank Shellac?

Do each exercise below and find your answer in the set of answers to the right of that exercise. Write the letter of your answer in the box containing the number of that exercise.

- |                    |                    |                   |
|--------------------|--------------------|-------------------|
| ① $(x + 4)(x + 2)$ | ⓓ $x^2 - 9x + 18$  | Ⓝ $x^2 + 4x + 7$  |
| ② $(x + 7)(x + 1)$ | Ⓐ $x^2 - 11x + 18$ | Ⓔ $x^2 + 8x + 7$  |
| ③ $(x - 6)(x - 3)$ | Ⓢ $x^2 - 5x - 28$  | Ⓓ $x^2 - 3x - 28$ |
| ④ $(x + 8)(x - 2)$ | ⓓ $x^2 + 6x + 8$   | Ⓡ $x^2 - 2x + 18$ |
| ⑤ $(x - 7)(x + 4)$ | Ⓐ $x^2 + 6x - 16$  | Ⓛ $x^2 + 3x - 16$ |
| ⑥ $(x - 2)(x - 9)$ |                    |                   |

- |                      |                      |                      |
|----------------------|----------------------|----------------------|
| ⑦ $(2u + 4)(u + 1)$  | Ⓛ $21u^2 + 30u - 24$ | Ⓛ $2u^2 + 6u + 4$    |
| ⑧ $(3u + 7)(u - 3)$  | Ⓥ $20u^2 - 14u + 2$  | Ⓢ $21u^2 + 23u - 24$ |
| ⑨ $(4u - 2)(5u - 1)$ | Ⓤ $3u^2 + u - 21$    | Ⓨ $20u^2 - 52u + 32$ |
| ⑩ $(2u + 1)(9u - 5)$ | Ⓞ $3u^2 - 2u - 21$   | Ⓔ $18u^2 - u - 5$    |
| ⑪ $(7u - 4)(3u + 6)$ | Ⓣ $18u^2 + 2u - 5$   | Ⓝ $20u^2 - 41u + 32$ |
| ⑫ $(5u - 8)(4u - 4)$ |                      |                      |

- |                        |                        |                          |
|------------------------|------------------------|--------------------------|
| ⑬ $(2x + y)(x + 3y)$   | Ⓔ $8x^2 + xy - 3y^2$   | Ⓣ $12x^2 - 9xy - 24y^2$  |
| ⑭ $(3x - y)(8x - y)$   | Ⓝ $8x^2 - 2xy - 3y^2$  | ⓓ $12x^2 - 12xy - 24y^2$ |
| ⑮ $(2x + y)(4x - 3y)$  | Ⓕ $2x^2 + 7xy + 3y^2$  | Ⓐ $15x^2 + 9xy - 8y^2$   |
| ⑯ $(5x - 2y)(3x + 4y)$ | Ⓡ $7x^2 + 8xy + 6y^2$  | Ⓢ $7x^2 + 17xy + 6y^2$   |
| ⑰ $(7x + 3y)(x + 2y)$  | Ⓡ $24x^2 - 11xy + y^2$ | Ⓡ $15x^2 + 14xy - 8y^2$  |
| ⑱ $(6x + 6y)(2x - 4y)$ |                        |                          |

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
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# What Did the Girl Melon Say When the Boy Melon Proposed Marriage?

Circle the number-letter pair next to each TRUE statement below. Write the letter in the matching numbered box at the bottom of the page. (Hint: You should circle eight number-letter pairs in each column.)

3-S	$(x + 5)(x + 2) = x^2 + 7x + 10$	5-U	$(2w - 6)(5w + 4) = 10w^2 - 22w - 24$
9-A	$(t - 7)(t - 1) = t^2 - 8t + 7$	8-D	$(8x - 1)(4x + 3) = 32x^2 + 24x - 3$
6-L	$(n - 9)(n - 3) = n^2 - 6n + 27$	11-T	$(3x + 2)(3x - 2) = 9x^2 - 4$
16-E	$(u - 3)(u + 6) = u^2 + 3u - 18$	4-B	$(a + b)(2a + b) = 2a^2 + 3ab + b^2$
6-T	$(a + 9)(a - 8) = a^2 + a - 72$	15-A	$(2c + 6d)(c - d) = 2c^2 + 8cd - 6d^2$
7-R	$(x + 4)(x - 10) = x^2 - 14x - 40$	2-E	$(4x - y)(3x + 2y) = 12x^2 + 5xy - 2y^2$
14-O	$(3m + 1)(m + 5) = 3m^2 + 16m + 5$	8-C	$(2u - 5v)(2u - 8v) = 4u^2 - 26uv + 40v^2$
5-N	$(8d + 3)(2d + 1) = 16d^2 + 14d + 4$	10-P	$(9a + b)(2a + 5b) = 18a^2 + 47ab - 5b^2$
7-I	$(2k - 4)(3k - 2) = 6k^2 - 16k + 8$	13-R	$(2a - 2b)(a + 10b) = 2a^2 - 8ab - 20b^2$
12-E	$(x + 8)(2x - 6) = 2x^2 + 10x - 48$	15-P	$(7m + n)(m - 3n) = 7m^2 - 20mn - 3n^2$
2-A	$(4n - 2)(n + 5) = 4n^2 + 22n - 10$	10-N	$(x^2 - 4)(x^2 - 9) = x^4 - 13x^2 + 36$
1-Y	$(3v - 2)(5v + 4) = 15v^2 + 2v - 8$	3-D	$(k^2 - 6)(k^2 + 3) = k^4 - 9k^2 - 18$
11-I	$(2y + 9)(3y - 1) = 5y^2 + 25y - 9$	13-L	$(x^2 + 2y)(x^2 - 2y) = x^4 - 4y^2$

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
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# Why Didn't Klutz Do Any Homework on Saturday?



Either multiply or factor, as directed, and find your answer in the adjacent answer column. Write the letter of that exercise in the box that contains the number of the answer.

**Multiply:**

- I  $(a + 5)(a - 5)$   
 D  $(2 + 3a)(2 - 3a)$   
 E  $(7a - 1)(7a + 1)$   
 N  $(a^2 - 6)(a^2 + 6)$   
 A  $(4a + b)(4a - b)$   
 O  $(2a^2 - 5b)(2a^2 + 5b)$
- 4  $16a^2 - b^2$   
 13  $49a^2 - 1$   
 6  $a^2 - 25$   
 17  $4a^4 - 25b^2$   
 15  $4 - 9a^2$   
 12  $4a^4 - 36$   
 24  $a^4 - 36$

**Factor:**

- S  $x^2 - y^2$   
 I  $4x^2 - 49y^2$   
 W  $81x^2 - 100y^2$   
 E  $36x^2 - 121y^2$   
 O  $9x^2 - 64y^2$   
 N  $x^4 - 400$
- 3  $(9x + 10y)(9x - 10y)$   
 5  $(x + y)(x - y)$   
 7  $(x^2 + 20)(x^2 - 20)$   
 11  $(6x + 11y)(6x - 11y)$   
 16  $(3x + 7y)(3x - 7y)$   
 22  $(2x + 7y)(2x - 7y)$   
 23  $(3x + 8y)(3x - 8y)$

**Factor:**

- E  $n^2 - 49$   
 A  $n^2 - 1$   
 N  $81 - n^2$   
 H  $4n^2 - 9$   
 I  $49n^2 - 16$   
 E  $144 - 25n^2$
- 1  $(2n + 3)(2n - 3)$   
 10  $(12 + 5n)(12 - 5n)$   
 8  $(n + 1)(n - 1)$   
 5  $(7n + 3)(7n - 3)$   
 2  $(n + 7)(n - 7)$   
 18  $(9 + n)(9 - n)$   
 20  $(7n + 4)(7n - 4)$

**Factor:**

- T  $a^6 - b^4$   
 C  $25a^8 - 9b^4$   
 W  $a^2b^2 - 36$   
 D  $16 - a^4b^6$   
 K  $a^2b^4 - c^8$   
 N  $4a^{16} - 225$
- 19  $(4 + a^2b^3)(4 - a^2b^3)$   
 14  $(2a^8 + 15)(2a^8 - 15)$   
 21  $(a^3 + b^2)(a^3 - b^2)$   
 12  $(ab^2 + c^4)(ab^2 - c^4)$   
 9  $(ab + 6)(ab - 6)$   
 16  $(5a^4 + 3b^2)(5a^4 - 3b^2)$   
 10  $(4 + ab^4)(4 - ab^4)$

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
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# Why Did King Kong Eat a Truck ?

Circle the appropriate number-letter pairs in each column. Write the letter in the matching numbered box at the bottom of the page. (Hint: You should circle 11 number-letter pairs in each column.)

Circle the number-letter of each TRUE STATEMENT:

- 8-S  $(x + 2)^2 = x^2 + 4x + 4$
- 13-E  $(a - 5)^2 = a^2 - 10a + 25$
- 10-A  $(u + 8)^2 = u^2 + 16u + 64$
- 2-H  $(m - 4)^2 = m^2 - 16m + 16$
- 18-G  $(3x + 1)^2 = 9x^2 + 6x + 1$
- 14-D  $(5t - 2)^2 = 25t^2 - 20t + 4$
- 4-P  $(2b + 3)^2 = 4b^2 + 12b + 6$
- 20-A  $(2n + 7)^2 = 4n^2 + 28n + 49$
- 2-E  $(10d - 4)^2 = 100d^2 - 80d + 16$
- 5-K  $(8x - 1)^2 = 16x^2 - 16x + 1$
- 7-R  $(4w + 5)^2 = 16w^2 + 20w + 25$
- 4-L  $(x^2 - 3)^2 = x^4 - 6x^2 + 9$
- 11-T  $(k^2 + 9)^2 = k^4 - 18k^2 + 81$
- 5-W  $(2a + b)^2 = 4a^2 + 4ab + b^2$
- 15-A  $(3u - 2v)^2 = 9u^2 - 12uv + 4v^2$
- 6-E  $(8a + b)^2 = 64a^2 + 8ab + b^2$
- 1-H  $(c^2 - 6d^2)^2 = c^4 - 12c^2d^2 + 36d^4$
- 21-I  $(2xy - 5)^2 = 4x^2y^2 - 20xy + 10$

Circle the number-letter of each TRINOMIAL SQUARE:

- 6-A  $n^2 + 6n + 9$
- 11-N  $x^2 - 14x + 49$
- 3-R  $a^2 + 2a + 4$
- 7-Y  $c^2 + 2c + 1$
- 12-B  $k^2 - 5k + 25$
- 21-C  $x^2 - 12x + 36$
- 3-A  $4t^2 + 12t + 9$
- 12-T  $81x^2 - 18x + 1$
- 17-L  $4m^2 + 8m + 16$
- 16-B  $9w^2 - 24w + 16$
- 9-F  $25t^2 - 45t + 9$
- 22-D  $4x^4 + 8x^2 + 1$
- 9-W  $a^2 + 2ab + b^2$
- 22-K  $4m^2 + 20mn + 25n^2$
- 19-L  $9a^2 - 27ab + 9b^2$
- 17-I  $100u^2 - 60uv + 9v^2$
- 8-E  $100a^2 + 20ab + 4b^2$
- 19-M  $9x^4 + 6x^2y^2 + y^4$

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
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# What Happens If the Jolly Green Giant Steps on Your House?

For exercises in the first column, express each square as a trinomial. For the remaining exercises, factor each trinomial as the square of a binomial, if possible. (If this is not possible, the correct answer is "not possible.") Find your answer below. Write the letter of the exercise in the box containing the number of its answer.

**Express as a trinomial:**

- (E)  $(u + 3)^2$
- (O)  $(u - 8)^2$
- (S)  $(2u + 5)^2$
- (L)  $(1 - 4u)^2$
- (T)  $(u + 2v)^2$
- (U)  $(7u - 3v)^2$
- (O)  $(uv + 6)^2$

Answers:

- (13)  $4u^2 + 20u + 25$
- (3)  $4u^2 + 16u + 25$
- (9)  $u^2 + 6u + 9$
- (10)  $u^2 + 4uv + 4v^2$
- (14)  $49u^2 - 31uv + 9v^2$
- (6)  $1 - 8u + 16u^2$
- (2)  $u^2 - 16u + 64$
- (18)  $u^2v^2 + 12uv + 36$
- (5)  $u^2 + 7uv + 4v^2$
- (12)  $49u^2 - 42uv + 9v^2$

**Factor:**

- (E)  $t^2 + 4t + 4$
- (U)  $t^2 - 12t + 36$
- (L)  $t^2 - 18t + 81$
- (Y)  $25 + 10t + t^2$
- (W)  $4t^2 + 20t + 25$
- (S)  $9t^2 - 12t + 4$
- (I)  $t^2 + 10t + 20$

Answers:

- (5) not possible
- (7)  $(t - 9)^2$
- (19)  $(t - 12)^2$
- (4)  $(2t + 5)^2$
- (15)  $(t + 2)^2$
- (21)  $(3t - 2)^2$
- (16)  $(2t - 9)^2$
- (3)  $(t - 6)^2$
- (1)  $(5 + t)^2$
- (8)  $(3t - 5)^2$

**Factor:**

- (D)  $49a^2 + 14a + 1$
- (O)  $16a^2 - 24a + 9$
- (G)  $a^2 - 8a + 64$
- (M)  $a^2 + 2ab + b^2$
- (H)  $a^2 + 10ab + 25b^2$
- (R)  $4a^2 - 12ab + 9b^2$
- (M)  $100a^2 - 20ab + b^2$

Answers:

- (8) not possible
- (11)  $(10a - 3b)^2$
- (16)  $(7a + 1)^2$
- (11)  $(10a - b)^2$
- (20)  $(a + b)^2$
- (17)  $(2a - 3b)^2$
- (19)  $(4a - 3)^2$
- (20)  $(a + 3b)^2$
- (14)  $(a + 5b)^2$
- (19)  $(4a - 8)^2$



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
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# Why Does Gyte Never, Never, Ever Bet on Even Numbers?



Factor completely each polynomial below. Find your answer and notice the two letters next to it. Write these letters in the two boxes at the bottom of the page that contain the number of that exercise.

- ①  $3x^2 - 75$
- ②  $5x^2 + 30x + 45$
- ③  $x^3 - 49x$
- ④  $2x^2 - 24x + 72$

- LO  $5(x - 4)^2$
- EL  $2(x - 12)^2$
- HE  $3(x + 5)(x - 5)$
- EA  $x(x + 8)(x - 8)$

- SF  $5(x + 3)^2$
- NT  $2(x - 6)^2$
- CH  $3(x + 2)(x - 2)$
- ST  $x(x + 7)(x - 7)$

- ⑤  $2k^3 - 8k$
- ⑥  $54k^2 - 24$
- ⑦  $5k^3 + 100k^2 + 500k$
- ⑧  $12k^2 - 36k + 27$

- HI  $5k(k + 10)^2$
- EN  $3(k - 2)^2$
- SO  $2k(k + 4)(k - 4)$
- DS  $6(3k + 2)(3k - 2)$

- HE  $2k(k + 2)(k - 2)$
- LS  $6(3k + 1)(3k - 1)$
- OR  $3(2k - 3)^2$
- TE  $5k(k + 8)^2$

- ⑨  $7a^3b - 7ab^3$
- ⑩  $32a^2b^2 + 16ab^2 + 2b^2$
- ⑪  $4a^3b - 40a^2b^2 + 100ab^3$
- ⑫  $4a^4b^3 - a^2b$

- MI  $7ab(a + 2b)^2$
- LA  $4ab(a - 3b)^2$
- OD  $a^2b(2ab + 1)(2ab - 1)$
- WA  $7ab(a + b)(a - b)$

- AT  $2b^2(2a + 4)^2$
- AV  $4ab(a - 5b)^2$
- MA  $a^2b(ab + 2)(ab - 2)$
- IN  $2b^2(4a + 1)^2$

5	5	9	9	4	4	3	3	1	1	12	12	6	6	10	10	7	7	2	2	11	11	8	8
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# A DRASTIC WAY TO DIET



AN EXTREME BUT EFFECTIVE WAY TO DIET IS HIDDEN IN THE LETTERS BELOW.  
TO FIND IT:

Factor each trinomial below. Find the factored form in the set of answers under the exercise and cross out the letter above it. When you finish, the diet will remain. You might call it the "Algebra diet."

- ①  $m^2 + 8m + 7$
- ②  $m^2 + 5m + 6$
- ③  $m^2 + 10m + 9$
- ④  $m^2 - 6m + 8$
- ⑤  $m^2 - 8m + 12$
- ⑥  $m^2 + 11m + 24$

- ⑦  $d^2 - 8d + 15$
- ⑧  $d^2 - 12d + 20$
- ⑨  $d^2 + 14d + 13$
- ⑩  $d^2 - 13d + 36$
- ⑪  $d^2 + 17d + 30$
- ⑫  $d^2 + 9d + 18$

- ⑬  $x^2 + 5xy + 4y^2$
- ⑭  $x^2 - 18xy + 32y^2$
- ⑮  $x^2 - 13xy + 40y^2$
- ⑯  $x^2 + 7xy + 12y^2$
- ⑰  $x^2 - 27xy + 26y^2$
- ⑱  $x^2 + 19xy + 60y^2$

G	E	B	A	S	U	T	O	Y	F	N	U	L	E	O	M	A	T	O	R	E	G	I	A	N	L	T
$(m - 2)(m - 4)$	$(m + 9)(m + 1)$	$(m + 8)(m + 1)$	$(m - 2)(m - 6)$	$(m + 7)(m + 1)$	$(m + 3)(m + 4)$	$(m + 2)(m + 3)$	$(m + 8)(m + 3)$	$(m - 2)(m - 8)$	$(d + 1)(d + 13)$	$(d + 2)(d + 9)$	$(d + 2)(d + 15)$	$(d - 5)(d - 3)$	$(d - 10)(d - 2)$	$(d - 2)(d - 18)$	$(d - 5)(d - 4)$	$(d - 4)(d - 9)$	$(d + 6)(d + 3)$	$(x - 16y)(x - 2y)$	$(x + 4y)(x + 15y)$	$(x + 2y)(x + 4y)$	$(x + y)(x + 4y)$	$(x + 4y)(x + 3y)$	$(x + 20y)(x + 3y)$	$(x - 5y)(x - 8y)$	$(x - 2y)(x - 13y)$	$(x - - 26y)(x - y)$

# Did You Hear About...

$(t + 3)(t - 2)$	STARTED
$(t + 6)(t - 1)$	WHO
$(t + 6)(t - 2)$	RED
$(t + 5)(t - 2)$	THE
$(t - 9)(t + 8)$	BECAUSE
$(t - 4)(t + 2)$	JOINED
$(t - 4)(t + 5)$	ARMY
$(t - 10)(t + 2)$	CROSS
$(t + 7)(t - 3)$	CAT
$(t + 4)(t - 3)$	AFTER
$(t - 11)(t + 1)$	THE

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

$(x - 18)(x + 1)$	WANTED
$(x + 9y)(x - 4y)$	KIT
$(x - 18y)(x + 2y)$	BAND
$(x - 12y)(x + 3y)$	AID
$(x + 5y)(x - 3y)$	A
$(x + 8)(x - 3)$	TO
$(x + 6)(x - 4)$	HELP
$(x + 6)(x - 3)$	IT
$(x - 25y)(x + 2y)$	LION
$(x - 12)(x + 2)$	BE
$(x - 10y)(x + 5y)$	FIRST

Factor each trinomial below. Find the factored form in the answer column nearest the exercise, and notice the word beneath it. Write this word in the box containing the letter of that exercise. Keep working and you will hear about a kitty cat.

- A  $t^2 + 3t - 10$   
 B  $t^2 + 4t - 21$   
 C  $t^2 + 5t - 6$   
 D  $t^2 - 2t - 8$   
 E  $t^2 - 10t - 11$   
 F  $t^2 + 4t - 12$   
 G  $t^2 - 8t - 20$   
 H  $t^2 - t - 72$

- I  $x^2 + 3x - 18$   
 J  $x^2 - 17x - 18$   
 K  $x^2 + 5x - 24$   
 L  $x^2 - 10x - 24$   
 M  $x^2 + 2xy - 15y^2$   
 N  $x^2 - 5xy - 50y^2$   
 O  $x^2 - 9xy - 36y^2$   
 P  $x^2 + 5xy - 36y^2$

# When Is a Wrestler “King of the Ring”?

Factor each trinomial below. Find your answer and notice the letter next to it. Write this letter in the box containing the number of that exercise. Keep working and you will get the gripping answer to the title question.

- ①  $n^2 + 6n + 5$
- ②  $n^2 + 7n + 10$
- ③  $n^2 - 7n + 12$
- ④  $n^2 - 11n + 28$
- ⑤  $n^2 + 2n - 15$
- ⑥  $n^2 - 5n - 24$
- ⑦  $n^2 + n - 56$

Answers:

- Ⓕ  $(n + 2)(n + 6)$
- Ⓗ  $(n + 5)(n - 3)$
- Ⓦ  $(n + 5)(n + 1)$
- Ⓔ  $(n - 3)(n - 4)$
- Ⓑ  $(n - 1)(n + 15)$
- Ⓢ  $(n + 8)(n - 7)$
- Ⓗ  $(n + 2)(n + 5)$
- Ⓔ  $(n - 8)(n + 3)$
- Ⓡ  $(n - 12)(n - 2)$
- Ⓝ  $(n - 7)(n - 4)$

- ⑧  $t^2 + 10t + 16$
- ⑨  $t^2 - 15t + 50$
- ⑩  $t^2 + 8t - 9$
- ⑪  $t^2 - 7t - 30$
- ⑫  $t^2 - t - 30$
- ⑬  $t^2 + 14t + 48$
- ⑭  $t^2 + 8t - 48$

Answers:

- Ⓝ  $(t - 6)(t + 5)$
- Ⓥ  $(t - 25)(t + 2)$
- Ⓣ  $(t - 5)(t - 10)$
- Ⓣ  $(t + 6)(t + 8)$
- Ⓞ  $(t - 10)(t + 3)$
- Ⓑ  $(t + 15)(t - 2)$
- Ⓘ  $(t + 8)(t + 2)$
- Ⓗ  $(t - 4)(t + 12)$
- Ⓢ  $(t + 9)(t - 1)$
- Ⓐ  $(t - 24)(t + 2)$

- ⑮  $a^2 + 5ab + 6b^2$
- ⑯  $a^2 - 4ab - 21b^2$
- ⑰  $a^2 + 6ab - 7b^2$
- ⑱  $a^2 - 14ab - 32b^2$
- ⑲  $a^2 - 29ab + 100b^2$
- ⑳  $a^2 + 7ab - 18b^2$
- ㉑  $a^2 + 2ab + b^2$

Answers:

- Ⓚ  $(a - 8b)(a + 4b)$
- Ⓗ  $(a + 7b)(a - b)$
- Ⓐ  $(a - 20b)(a + 5b)$
- Ⓔ  $(a + 2b)(a + 3b)$
- Ⓦ  $(a + 9b)(a - 2b)$
- Ⓣ  $(a - 7b)(a + 3b)$
- Ⓞ  $(a - 25b)(a - 4b)$
- Ⓢ  $(a + 6b)(a + 3b)$
- Ⓝ  $(a + b)(a + b)$
- Ⓡ  $(a - 16b)(a + 2b)$



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
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# What Happened When the Boarding House Blew Up?

Factor each trinomial below. Find one of the factors in **each** column of binomials. Notice the letter next to one factor and the number next to the other. Write the letter in the box at the bottom of the page that contains the matching number.

- |                     |              |              |
|---------------------|--------------|--------------|
| ① $3x^2 + 7x + 2$   | ⑤ $(5u + 3)$ | ① $(3u - 2)$ |
| ② $2x^2 + 5x + 3$   | ③ $(x - 1)$  | ② $(x - 5)$  |
| ③ $3x^2 - 16x + 5$  | ⑧ $(3x + 1)$ | ③ $(8u - 1)$ |
| ④ $7x^2 - 9x + 2$   | ⑭ $(3u - 1)$ | ④ $(7x - 2)$ |
| ⑤ $6u^2 + 5u + 1$   | ⑥ $(2u + 3)$ | ⑤ $(5u + 1)$ |
| ⑥ $8u^2 - 9u + 1$   | ⑮ $(x + 1)$  | ⑥ $(x + 2)$  |
| ⑦ $10u^2 + 17u + 3$ | ⑨ $(5u + 6)$ | ⑦ $(7x + 2)$ |
| ⑧ $9u^2 - 9u + 2$   | ⑦ $(2u + 1)$ | ⑧ $(2x + 3)$ |
| ⑨ $5u^2 + 11u + 6$  | ⑪ $(3x - 1)$ | ⑨ $(u + 1)$  |
|                     | ⑰ $(u - 1)$  | ⑩ $(3u + 1)$ |

- |                    |              |              |
|--------------------|--------------|--------------|
| ⑩ $3n^2 + 2n - 1$  | ⑫ $(3t - 1)$ | ① $(n + 3)$  |
| ⑪ $5n^2 - 4n - 1$  | ⑤ $(n - 1)$  | ② $(t - 1)$  |
| ⑫ $2n^2 + 5n - 3$  | ④ $(3t + 1)$ | ③ $(2t + 1)$ |
| ⑬ $7n^2 - 13n - 2$ | ⑩ $(n - 2)$  | ④ $(n + 1)$  |
| ⑭ $3t^2 + 14t - 5$ | ⑬ $(t + 1)$  | ⑤ $(t + 5)$  |
| ⑮ $4t^2 - 11t + 7$ | ② $(3n - 1)$ | ⑥ $(5n + 1)$ |
| ⑯ $6t^2 + 5t - 1$  | ⑯ $(2n - 1)$ | ⑦ $(t - 7)$  |
| ⑰ $3t^2 - 20t - 7$ | ④ $(3t - 7)$ | ⑧ $(7n + 1)$ |
|                    | ① $(4t - 7)$ | ⑨ $(6t - 1)$ |

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
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WHAT DID MRS. ZLING SAY WHEN MR. ZLING SAID HE WAS GOING MOUNTAIN CLIMBING IN THE HIMALAYAS?

Factor each trinomial below. Find both factors in the rectangle below and cross out each box containing a factor. You will cross out **two** boxes for each exercise. When you finish, print the letters from the remaining boxes in the squares at the bottom of the page.

- ①  $6x^2 + 19x + 3$       ⑥  $15m^2 + 19m + 6$   
 ②  $5x^2 - 9x - 2$       ⑦  $8m^2 - 5m - 3$   
 ③  $9x^2 + 15x + 4$       ⑧  $4m^2 - 17m + 18$   
 ④  $7x^2 + x - 8$       ⑨  $14m^2 + 17m - 22$   
 ⑤  $2x^2 - 21x + 40$       ⑩  $3m^2 - m - 30$

TH ( $4m - 9$ )	AT ( $3x + 1$ )	PA ( $m - 2$ )	DO ( $m - 3$ )	NE ( $2x - 5$ )	XT ( $3m - 10$ )	CK ( $14m - 11$ )	YO ( $2m - 3$ )	UR ( $5x + 1$ )
UP ( $6x + 1$ )	UW ( $15m + 1$ )	IN ( $x + 3$ )	PL ( $m + 2$ )	AN ( $x + 4$ )	DA ( $5m + 3$ )	RE ( $x - 2$ )	MA ( $3m + 2$ )	TT ( $9x + 2$ )
CO ( $7x + 8$ )	LD ( $3x + 4$ )	IB ( $7x + 2$ )	ER ( $8m + 3$ )	AJ ( $m + 3$ )	ET ( $7m + 2$ )	ON ( $x - 8$ )	HI ( $m - 1$ )	GH ( $x - 1$ )

# How Can Fishermen Save Gas ?

Factor each polynomial below. Find one of the factors in **each** column of binomials. Notice the letter next to one factor and the number next to the other. Write the letter in the box at the bottom of the page that contains the matching number.

①  $4n^2 - 49$

②  $n^2 + 8n + 12$

③  $n^2 - 9n + 20$

④  $n^2 + 16n + 64$

⑤  $n^2 + 2n - 15$

⑥  $3n^2 - 8n + 5$

③  $(n + 1)$

⑪  $(n + 2)$

②  $(n + 8)$

⑨  $(2n + 7)$

④  $(n + 5)$

⑱  $(n - 1)$

⑭  $(n - 4)$

ⓐ  $(n - 3)$

ⓖ  $(2n - 7)$

Ⓟ  $(n - 5)$

Ⓢ  $(3n - 5)$

Ⓨ  $(n + 8)$

Ⓚ  $(3n - 1)$

Ⓐ  $(n + 6)$

⑦  $a^2 + 4a - 21$

⑧  $5a^2 + 9a - 2$

⑨  $2a^2 + 11a + 15$

⑩  $1 - 9a^4$

⑪  $a^2 - 11a + 30$

⑫  $10a^2 - 3a - 1$

①  $(a - 5)$

⑬  $(a + 7)$

⑤  $(5a + 1)$

⑦  $(a + 2)$

⑮  $(a - 1)$

⑧  $(1 - 3a^2)$

⑯  $(2a + 5)$

ⓖ  $(2a + 1)$

Ⓑ  $(a - 6)$

Ⓟ  $(a - 3)$

ⓐ  $(a + 3)$

Ⓘ  $(5a - 1)$

Ⓡ  $(2a - 1)$

Ⓝ  $(1 + 3a^2)$

⑬  $8u^2 + 19u + 6$

⑭  $25u^2 - 20u + 4$

⑮  $3u^2 - 11u - 14$

⑯  $u^2 - 4u - 21$

⑰  $6u^2 + 17u - 10$

⑱  $2u^2 + 5u - 18$

⑩  $(u + 3)$

⑫  $(2u + 9)$

⑰  $(u - 3)$

③  $(5u - 2)$

⑥  $(3u - 14)$

⑮  $(u + 2)$

⑰  $(3u + 10)$

Ⓜ  $(u + 1)$

Ⓑ  $(2u + 1)$

ⓐ  $(8u + 3)$

Ⓘ  $(2u - 1)$

Ⓒ  $(u - 7)$

Ⓡ  $(u - 2)$

Ⓕ  $(5u - 2)$

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
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# What Do You Call a Sore on a Police Officer's Foot ?

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

①  $3x^2 - 15x + 18$

②  $x^3 + 11x^2 + 10x$

③  $8x^3 - 18x$

④  $5x^3 - 40x^2 + 60x$

⑤  $4x^2 + 8x - 60$

⑥  $2x^3 - 20x^2 - 48x$

Answers:

①  $5x(x + 3)(x - 4)$

②  $2x(2x + 3)(2x - 3)$

③  $2x(x + 6)(x - 4)$

④  $3(x - 2)(x - 3)$

⑤  $4(x + 5)(x - 3)$

⑥  $x(x + 5)(x + 3)$

⑦  $4(x + 5)(x - 1)$

⑧  $x(x + 10)(x + 1)$

⑨  $2x(x - 12)(x + 2)$

⑩  $5x(x - 2)(x - 6)$

⑪  $2x(4x + 9)(x + 1)$

⑦  $4m^2 - 18m + 14$

⑧  $15m^3 + 24m^2 + 9m$

⑨  $15m^2 - 10m - 25$

⑩  $50m^3 - 2m$

⑪  $3m^2 - 10m + 8$

⑫  $60m^3 + 54m^2 - 6m$

Answers:

⑦  $3m(5m + 3)(m + 1)$

⑧  $5(3m + 1)(m - 5)$

⑨  $(3m - 4)(m - 2)$

⑩  $2(2m + 1)(m + 7)$

⑪  $5(3m - 5)(m + 1)$

⑫  $6m(5m - 1)(2m - 1)$

⑬  $3m(5m + 2)(m - 1)$

⑭  $2(2m - 7)(m - 1)$

⑮  $2m(5m + 1)(5m - 1)$

⑯  $6m(10m - 1)(m + 1)$

⑰  $(3m - 2)(m + 4)$

5

8

11

7

1

3

9

6

2

12

4

10

# Old Lawyers Never Die, They Just

14 12 5 4 1 10 4 7 9 2 13 13 4 2 14

# Old Skiers Never Die, They Just

8 12 3 12 6 11 10 7 14 14



YOU MAY HAVE HEARD THAT OLD MATH TEACHERS NEVER DIE, THEY JUST REDUCE TO LOWEST TERMS. TO FIND OUT WHAT HAPPENS TO OLD LAWYERS AND SKIERS, FOLLOW THESE DIRECTIONS:

Factor completely each polynomial below. Find your answer in the appropriate answer column and notice the letter next to it. Each time the exercise number appears in the code, write this letter above it.

Answers for 1–7:

- (C)  $(3x + 5)(x - 2)$
- (I)  $5x(2x - 7)(x + 1)$
- (T)  $2(x + 2)(x + 9)$
- (Y)  $a(x + 6)(x + 2)$
- (S)  $x^2(x + 10)(x - 2)$
- (D)  $2x(3x + 7)(3x - 7)$
- (M)  $x^2(x + 4)(x - 5)$
- (B)  $2(x + 3)(x + 6)$
- (A)  $5x(x - 4)(x + 2)$
- (F)  $2x(9x - 7)(x + 7)$
- (W)  $(3x + 10)(x + 1)$
- (K)  $5x(2x - 1)(x + 7)$
- (E)  $a(x - 3)(x - 4)$

(1)  $2x^2 + 22x + 36$

(2)  $5x^3 - 10x^2 - 40x$

(3)  $18x^3 - 98x$

(4)  $ax^2 - 7ax + 12a$

(5)  $x^4 + 8x^3 - 20x^2$

(6)  $3x^2 + 13x + 10$

(7)  $10x^3 - 25x^2 - 35x$

(8)  $12u^2 - 28u - 24$

(9)  $u^4 - 3u^2 - 4$

(10)  $15u^4 + 2u^3 - u^2$

(11)  $2u^2v - 18uv + 28v$

(12)  $12u^3 + 36u^2 + 27u$

(13)  $40u^2 + 15u - 55$

(14)  $u^4 - 10u^2 + 9$

Answers for 8–14:

(H)  $u^2(5u - 1)(3u + 1)$

(V)  $3u(4u + 3)(u + 3)$

(L)  $(u + 1)(u - 1)(u + 3)(u - 3)$

(N)  $2v(u - 7)(u - 2)$

(K)  $4(3u + 6)(u - 1)$

(B)  $(u^2 + 9)(u + 1)(u - 2)$

(G)  $4(3u + 2)(u - 3)$

(M)  $u^2(15u + 1)(u - 1)$

(P)  $5(8u + 11)(u - 1)$

(U)  $2v(u + 14)(u + 1)$

(R)  $(u^2 + 1)(u + 2)(u - 2)$

(F)  $5(4u + 11)(2u + 1)$

(O)  $3u(2u + 3)^2$

# Did You Hear About...

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

Answers for A–G:

$(2b - 3)(r + 4)$ HUNTED
$(5c - d)(2c - d)$ WHEN
$(x + 3)(x - 2)$ THE
$(a + 2)(5a - 2)$ HE
$(x^2 + 1)(k + 4)$ BEAR
$(k^2 - 7)(x + 3)$ THE
$(a + 2)(2a + 5)$ MAN
$(k - 2)(x + 3)$ DEER
$(n - 5)(3n - 1)$ WHO
$(2b + 4)(r - 3)$ SHOT
$(5c - d)(2c + 4d)$ UNTIL



Factor each expression below. Find your answer in the appropriate answer column and notice the word beneath it. Write this word in the box containing the letter of that exercise. Keep working and you'll hear what's "bruin."

- (A)  $x(x - 2) + 3(x - 2)$
- (B)  $a(2a + 5) + 2(2a + 5)$
- (C)  $n(3n - 1) - 5(3n - 1)$
- (D)  $2b(r + 4) - 3(r + 4)$
- (E)  $(x^2 + 1)k + (x^2 + 1)4$
- (F)  $(5c - d)(2c) + (5c - d)(4d)$
- (G)  $k^2(x + 3) - 7(x + 3)$
- (H)  $w^2(3w - 1) + (3w - 1)$
- (I)  $2d(5 - n^2) + (5 - n^2)$
- (J)  $5t^2(t + 7) - (t + 7)$
- (K)  $3u^2(u^2 + v^2) - v^2(u^2 + v^2)$
- (L)  $(a - 2b)3a - (a - 2b)5b$
- (M)  $6h(x^3 - 4) - (x^3 - 4)$
- (N)  $(y^2 + 3)y^2 + 3(y^2 + 3)$

Answers for H–N:

$(6 - h)(x^3 - 4)$ MISS
$(5t^2 - 1)(t + 7)$ MADE
$(6h - 1)(x^3 - 4)$ ON
$(a - 2b)(5a + 3b)$ BEAR
$(2d + 1)(5 - n^2)$ RANGER
$(a - 2b)(3a - 5b)$ PUT
$(w^2 + 1)(3w - 1)$ FOREST
$(2d - 5)(5 - n^2)$ SHOOT
$(3u^2 - v^2)(u^2 + v^2)$ HIM
$(y^2 + 3)^2$ CLOTHES
$(u^2 + 3v^2)(u^2 + v^2)$ A

# How Did Snidely Spellbinder Write a Four-Letter Word That Begins and Ends With "E"?



Write each expression below in factored form. Find your answer in the set of answers under the exercise and cross out the box above it. When you finish, the answer to the title question will remain.

- ①  $x^2 + 3x + xk + 3k$
- ②  $a^2 - 2a + ad - 2d$
- ③  $uv + 5u + v^2 + 5v$
- ④  $x^2 - xk + 4x - 4k$
- ⑤  $ad + 3a - d^2 - 3d$
- ⑥  $y^3 + y^2 + 2y + 2$

- ⑦  $m^3 + m^2n + mn^2 + n^3$
- ⑧  $u^3 - u^2v + uv^2 - v^3$
- ⑨  $t^2 + 2t + 3kt + 6k$
- ⑩  $2ab + 14a + b + 7$
- ⑪  $m^2 + mn - 3m - 3n$
- ⑫  $5x^2y - x^2 + 5y - 1$

B	$(a - d)(d + 3)$	L	$(u^2 + v^2)(u - v)$
W	$(u + 2)(v + 5)$	G	$(x^2 + 1)(5y - 1)$
E	$(x + 4)(x - k)$	E	$(7a + 2)(b + 7)$
A	$(a + d)(a - 2)$	T	$(t + 3k)(t + 2)$
I	$(2y^2 + 1)(y + 1)$	I	$(m^2 + n^2)(m + n)$
N	$(x + k)(x + 3)$	A	$(3t - k)(t + 2)$
T	$(a - d)(d - 2)$	S	$(m^2 - 2)(m + n)$
R	$(v^2 + 2)(v + 1)$	P	$(2a + 1)(b + 7)$
H	$(x + k)(4x + 3)$	E	$(2x + 5)(5y - 1)$
4	$(u + v)(v + 5)$	N	$(m - 3)(m + n)$

# What Happens to People Who Don't Know Toothpaste From Putty?

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

①  $3x^3 + 21x^2 + 30x$

②  $x^4 + x^3 - 56x^2$

③  $x^2 + 5x + xy + 5y$

④  $36x^3 - 64x$

⑤  $x^2 - xd + 7x - 7d$

⑥  $35x^2 - 100x - 15$

⑦  $xy + 8x - y^2 - 8y$

Answers:

⑤  $x^2(x + 28)(x + 2)$

①  $(x + y)(x + 5)$

③  $(x - y)(y + 8)$

④  $3x(x + 5)(x + 2)$

⑤  $(x + 7)(x - d)$

⑦  $(x - 2y)(y + 4)$

②  $x^2(x + 8)(x - 7)$

⑥  $5(7x + 1)(x - 3)$

⑦  $(x - 7)(x^2 + d)$

⑥  $4x(3x + 4)(3x - 4)$

⑦  $5(7x - 1)(2x + 3)$

⑧  $2ax^2 - 22ax + 60a$

⑨  $x^4 - y^4$

⑩  $x^3 - 9x + 5x^2 - 45$

⑪  $2ax^2 + 8ax + x + 4$

⑫  $x^4 - 29x^2 + 100$

⑬  $x^2y^2 - y^2 - 15x^2 + 15$

⑭  $8x^4 + 56x^3 + 98x^2$

Answers:

⑧  $(2ax + 1)(x + 4)$

③  $(x + 5)(x - 5)(x^2 + 3)$

⑨  $2x^2(2x + 7)^2$

⑩  $(x^2 + y^2)(x + y)(x - y)$

⑩  $(x + 2)(x - 2)(x + 5)(x - 5)$

⑪  $2a(x - 6)(x - 5)$

⑪  $(2ax - 4)(x + 1)$

⑬  $(y^2 - 15)(x + 1)(x - 1)$

⑬  $(x + 5)(x + 3)(x - 3)$

⑬  $(y^2 - 15)(x + 5)(x - 2)$

⑪  $2a(x + 15)(x - 2)$

4	8	6	10	1	14	10	3	11	13	14	5	7	2	12	12	13	9	4
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# Why Are Small Balloons Cheaper Than Large Balloons ?



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

①  $a^2 - 9ab + 20b^2$

②  $3a^2 + 6ab - 24b^2$

③  $7a^2 - 28b^2$

④  $4a^2 + 14ab + 12b^2$

⑤  $a^3 - 4a^2b - 21ab^2$

⑥  $a^3b - ab^3$

Answers:

Ⓔ  $7(a + 4b)(a + b)$

Ⓐ  $a(a - 7b)(a + 3b)$

Ⓞ  $7(a + 2b)(a - 2b)$

Ⓡ  $(a - 4b)(a - 5b)$

Ⓣ  $a(a + 21)(a - 1)$

ⓗ  $ab(a + b)(a - b)$

Ⓜ  $3(a - 8b)(a - b)$

Ⓒ  $2(2a - 6b)(a + b)$

Ⓝ  $3(a + 4b)(a - 2b)$

Ⓥ  $ab(a + 3b)(a - 2b)$

Ⓢ  $2(2a + 3b)(a + 2b)$

⑦  $2x^3 - 12x^2y - 14xy^2$

⑧  $9x^3 - 6x^2y + xy^2$

⑨  $15x^2 + 35xy - 50y^2$

⑩  $x^4 + 12x^3y + 35x^2y^2$

⑪  $15x^4 - 27x^3y - 6x^2y^2$

⑫  $8x^3y - 50xy^3$

Answers:

Ⓕ  $5(3x + 10y)(x - y)$

Ⓚ  $2x(x + 7y)(x + 2y)$

Ⓛ  $2xy(2x + 5y)(2x - 5y)$

ⓓ  $5(3x - 2y)(x - 5y)$

Ⓣ  $x^2(x + 5y)(x + 7y)$

Ⓑ  $x(3x - y)^2$

Ⓤ  $3x^2(5x - 2y)(x - y)$

Ⓜ  $2x(x - 7y)(x + y)$

Ⓟ  $x^2(x + 5y)(x - 9y)$

Ⓔ  $3x^2(5x + y)(x - 2y)$

Ⓦ  $x(9x + y)(x - y)$

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

# What Should You Say If You See a Tall, Wrought-Iron Tower in Paris, France?

Factor completely each polynomial. Find your answer below 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  $3n^2 - 17n + 24$

②  $4x^3y - 49xy^3$

③  $5x^2 + 20xy - 60y^2$

④  $3x^3 - x^2y + 12x - 4y$

⑤  $2x^4y - 3x^3y - 20x^2y$

⑥  $9x^3y + 33x^2y^2 + 30xy^3$

Answers:

AD  $5(x + 4y)(x + 3y)$

AN  $x^2y(2x + 5)(x - 4)$

OL  $(3n - 6)(n + 4)$

UI  $xy(2x - 7y)(2x + 7y)$

TH  $3xy(3x + 5y)(x + 2y)$

EF  $5(x + 6y)(x - 2y)$

ET  $(x^2 + 2)(3x + 2y)$

SR  $(3n - 8)(n - 3)$

FO  $xy(9x + 5y)(x - 7y)$

LL  $(x^2 + 4)(3x - y)$

NT  $x^2y(2x + 1)(x + 10)$

⑦  $16a^3b^4 + 40a^2b^5 + 8ab^3$

⑧  $t^4 - 37t^2 + 36$

⑨  $2a^7b^3 - 288ab$

⑩  $35a^2b - 5a - 7ab^2 + b$

⑪  $6a^4b^2 - 11a^3b^3 + 4a^2b^4$

⑫  $t^2(t + 3) + 6t(t + 3) + 9(t + 3)$

Answers:

IS  $2ab(a^2b^2 + 12)(a^4b^2 + 12)$

OT  $(t + 3)^2(t - 1)^2$

TE  $8ab^3(2a^2b + 5ab^2 + 1)$

AT  $2ab(a^3b + 12)(a^3b - 12)$

EY  $(t + 3)^3$

EP  $a^2b^2(2a + b)(3a - 2b)$

YQ  $(t + 1)(t - 1)(t + 6)(t - 6)$

UL  $(5a - b)(7ab - 1)$

LS  $8ab^3(2ab^2 + 5ab^3 + 1)$

IX  $(5a - 2b)(7ab - 5)$

EA  $a^2b^2(2a - b)(3a - 4b)$

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

# Moving Words

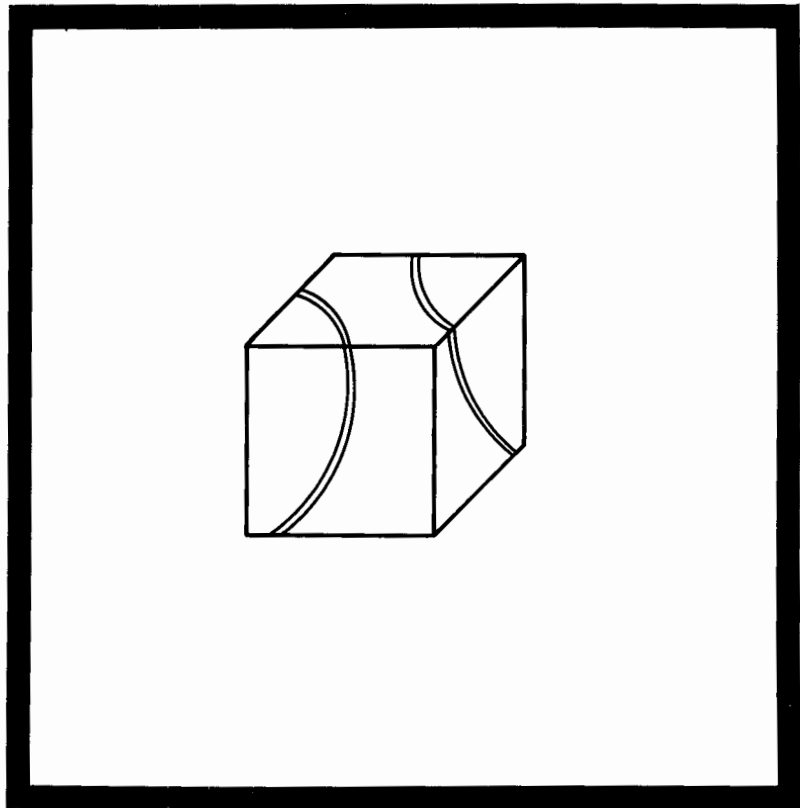
Solve each equation in the top block and find the solution set in the bottom block. Transfer the word from the top box to the corresponding bottom box. Keep working and you will get a moving fact.

$(x + 3)(x + 8) = 0$	$(x - 12)(x + 5) = 0$	$(x - 10)(4x - 3) = 0$	$x(4x + 7) = 0$
① WHY	⑥ THAT	⑪ ONLY	⑯ ROBBERS
$(x + 4)(x + 11) = 0$	$x(x - 9) = 0$	$(3x + 2)(3x - 2) = 0$	$x(2x + 1)(x - 6) = 0$
② THE	⑦ TO	⑫ BANK	⑰ PLACE
$(x - 5)(x - 2) = 0$	$x(x + 14)(x - 1) = 0$	$(9x - 2)(5x + 1) = 0$	$2x(4x - 8)(x + 1) = 0$
③ IS	⑧ THEY	⑬ BECAUSE	⑱ CANADA
$(x - 1)(x - 6) = 0$	$(2x - 1)(x + 4) = 0$	$(2x + 2)(7x + 6) = 0$	$7x(3x + 5)(5x + 2) = 0$
④ HAVE	⑨ IS	⑭ ESCAPED	⑲ TORONTO
$(x + 3)(x - 7) = 0$	$(x - 2)(3x + 1) = 0$	$(2x - 5)(3x + 1) = 0$	$(x - 9)(x + 1)(x - 1) = 0$
⑤ ALWAYS	⑩ THE	⑮ REASON	⑳ RUN
$\left\{2, -\frac{1}{3}\right\}$	$\left\{\frac{5}{2}, -\frac{1}{3}\right\}$	$\{-3, -8\}$	$\left\{-\frac{2}{3}, \frac{2}{3}\right\}$
$\left\{0, -\frac{7}{4}\right\}$	$\{-3, 7\}$	$\{9, -1, 1\}$	$\{0, 2, -1\}$
$\{5, 2\}$	$\left\{\frac{2}{9}, -\frac{1}{5}\right\}$	$\{12, -5\}$	$\{-4, -11\}$
$\left\{10, \frac{3}{4}\right\}$	$\left\{0, -\frac{1}{2}, 6\right\}$	$\{0, -14, 1\}$	$\left\{0, -\frac{5}{3}, -\frac{2}{5}\right\}$

# What Is the Title of This Picture ?

Solve each equation below. 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  $a^2 + 7a + 10 = 0$
- ②  $n^2 - 8n + 12 = 0$
- ③  $y^2 - 49 = 0$
- ④  $x^2 + 5x - 6 = 0$
- ⑤  $u^2 - 7u - 18 = 0$
- ⑥  $m^2 - 5m = 0$
- ⑦  $2t^2 + 5t - 3 = 0$
- ⑧  $3w^2 - 8w + 4 = 0$
- ⑨  $2x^2 - 3x - 5 = 0$
- ⑩  $5v^2 + 29v + 20 = 0$
- ⑪  $6n^2 - 19n + 15 = 0$
- ⑫  $2k^2 + 7k = 0$
- ⑬  $3b^2 + b - 10 = 0$
- ⑭  $4y^2 - 25 = 0$



CODED TITLE:

14
12
13
13
1
6
9
11
5
5

(

10
11
2
14
3
8
4
8
12
7
12
2
14

)

Ⓝ $\left\{\frac{5}{3}, -2\right\}$	ⓓ $\left\{\frac{3}{2}, \frac{5}{2}\right\}$	Ⓟ $\left\{\frac{5}{2}, -1\right\}$	Ⓛ $\{-2, 9\}$
Ⓡ $\left\{\frac{2}{3}, 2\right\}$	Ⓢ $\{-2, -5\}$	Ⓣ $\left\{0, -\frac{7}{2}\right\}$	ⓗ $\left\{\frac{3}{5}, -1\right\}$
Ⓢ $\{0, 5\}$	Ⓣ $\left\{\frac{5}{2}, -\frac{5}{2}\right\}$	Ⓨ $\{-6, 1\}$	Ⓒ $\{2, 6\}$
Ⓞ $\{7, -7\}$	ⓕ $\left\{-\frac{4}{5}, -5\right\}$	Ⓜ $\left\{\frac{1}{2}, -3\right\}$	ⓐ $\left\{\frac{3}{2}, \frac{5}{3}\right\}$

# Did You Hear About....

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

Solve each equation below. Find the solution set in one of the answer columns and notice the word next to it. Write this word in the box above that contains the letter of that exercise.

$$\{-8, 4\} \text{ WHO}$$

$$\{0, 15\} \text{ COACH}$$

$$\left\{\frac{8}{5}, 3\right\} \text{ SWIM}$$

$$\{7, 3\} \text{ THE}$$

$$\left\{-\frac{3}{5}, 3\right\} \text{ BECAUSE}$$

$$\{0, 11\} \text{ POLO}$$

$$\left\{-\frac{1}{2}, \frac{2}{3}\right\} \text{ WON}$$

$$\{-5, 1\} \text{ NOVICE}$$

$$\left\{-\frac{5}{2}, -\frac{3}{4}\right\} \text{ HORSE}$$

$$\left\{-\frac{1}{5}, \frac{3}{2}\right\} \text{ NOT}$$

$$\left\{\frac{1}{3}, -5\right\} \text{ WAS}$$

$$\left\{\frac{1}{5}, -\frac{5}{2}\right\} \text{ SCORE}$$

$$\{8, -1\} \text{ WATER}$$

$$\left\{\frac{4}{5}, -6\right\} \text{ RUN}$$

$$\{0, 9\} \text{ COULD}$$

$$\left\{\frac{5}{2}, 2\right\} \text{ UPSET}$$

$$\{-6, -3\} \text{ PLAYER}$$

$$\left\{\frac{4}{3}, -\frac{4}{3}\right\} \text{ HIS}$$

$$\textcircled{A} \ n^2 - 10n = -21$$

$$\textcircled{B} \ x^2 + 4x = 5$$

$$\textcircled{C} \ u^2 - 8 = 7u$$

$$\textcircled{D} \ m^2 = 11m$$

$$\textcircled{E} \ 9a = -a^2 - 18$$

$$\textcircled{F} \ h^2 = 32 - 4h$$

$$\textcircled{G} \ 3y^2 + 14y = 5$$

$$\textcircled{H} \ 2x^2 + 10 = 9x$$

$$\textcircled{I} \ 12t + 9 = 5t^2$$

$$\textcircled{J} \ 9y^2 = 16$$

$$\textcircled{K} \ 15 + 26d = -8d^2$$

$$\textcircled{L} \ 18n = 2n^2$$

$$\textcircled{M} \ 10v^2 = 13v + 3$$

$$\textcircled{N} \ 23p = 5p^2 + 24$$



# What Kind of Music Do Barbers and Tailors Play Together?



Solve each problem and find your answer at the bottom of the page. Cross out the letter above each correct answer. When you finish, you will have the answer to the noteworthy question above.



- ① Eight more than the square of a number is the same as 6 times the number. Find the number.
- ② Fifteen less than the square of a number is the same as twice the number. Find the number.
- ③ If a number is added to twice its square, the result is 6. Find the number.
- ④ Seven less than 4 times the square of a number is 18. Find the number.
- ⑤ Find two consecutive integers whose product is 56.

- ⑥ Find two consecutive positive odd integers whose product is 35.
- ⑦ The sum of the squares of two consecutive integers is 41. Find the integers.
- ⑧ Find two consecutive odd integers such that the square of the first, added to 3 times the second, is 24.
- ⑨ Find two consecutive even integers such that the square of the second, decreased by twice the first, is 52.
- ⑩ Find three consecutive positive integers such that the square of the first, increased by the last, is 22.

S	C	U	H	A	L	T	I	O	P	S	O	I	E	N	W	G
3, 5	4, 6 or -2, -4	5 or -3	4, 5, 6	5, 7	6, 7 or -7, -6	$\frac{2}{3}$ or -2	$\frac{4}{3}$ or -5	$\frac{2}{5}$ or $-\frac{2}{5}$	5, 6 or -6, -5	6 or -1	2 or 4	6, 8 or -8, -6	-9, -7	4, 5 or -5, -4	6, 7, 8	7, 8 or -8, -7

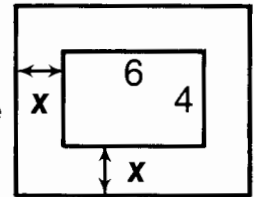
# Did You Hear About...

A	B	C	D
E	F	G	H ?

Solve each problem below. Find your answer in the 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 something hot.

- (A) The length of a rectangle is 3 cm more than the width. The area is  $70 \text{ cm}^2$ . Find the dimensions of the rectangle.
- (B) The length of a rectangle is 4 cm more than the width. The area is  $96 \text{ cm}^2$ . Find the dimensions of the rectangle.
- (C) The length of a photograph is 1 cm less than twice the width. The area is  $45 \text{ cm}^2$ . Find the dimensions of the photograph.
- (D) If the sides of a square are increased by 3 m, the area becomes  $64 \text{ m}^2$ . Find the length of a side of the original square.
- (E) A square field had 5 m added to its length and 2 m added to its width. The field then had an area of  $130 \text{ m}^2$ . Find the length of a side of the original field.
- (F) The dimensions of a rectangular garden were 4 m by 5 m. Each dimension was increased by the same amount. The garden then had an area of  $56 \text{ m}^2$ . Find the dimensions of the new garden. (Hint: Let  $x$  be the amount of increase.)
- (G) The dimensions of a rectangular garden were 3 m by 10 m. When both dimensions were increased by equal amounts, the area of the garden doubled. Find the dimensions of the new garden.

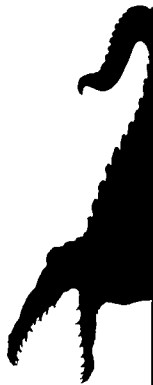
- (H) A 4 m by 6 m rug covers half of the floor area of a room and leaves a uniform strip of bare floor around the edges. What are the dimensions of the room?



6 m	THAT
5 m by 12 m	HOT
7 cm by 10 cm	THE
8 cm by 11 cm	CHAIRS
8 m	WHO
4 cm by 7 cm	GUY
5 m	DEALER
7 m by 9 m	PILLOWS
8 cm by 12 cm	CROOKED
7 m by 8 m	BUYS
5 m by 6 m	STUFF
6 m by 8 m	WATERBEDS
8 m by 9 m	SELLS
7 m by 14 m	TABLES
5 cm by 9 cm	FURNITURE



# What Do You Call an Alligator That Sneaks Up and Bites You From Behind?



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

①  $\frac{2x+10}{x+5}$

②  $\frac{x-3}{7x-21}$

③  $\frac{x^2-4}{x+2}$

④  $\frac{x^2-25}{3x-15}$

⑤  $\frac{x^2+4x}{x^2-9x}$

⑥  $\frac{n^2+7n+10}{n^2+2n-15}$

⑦  $\frac{n^2-7n+12}{n^2-2n-3}$

⑧  $\frac{n^2+7n-18}{n^2-4}$

⑨  $\frac{4n+28}{n^2+6n-7}$

⑩  $\frac{n-6}{n^2-6n}$

⑪  $\frac{2b^2-6b}{5b^2-15b}$

⑫  $\frac{b^2+4b-21}{2b^2-18}$

⑬  $\frac{3b^2+15b}{2b^3-50b}$

⑭  $\frac{b^2+4b+4}{2b^2+3b-2}$

⑮  $\frac{6b^3-24b^2}{b^2+b-20}$

AB	CH	AT	ES	AD	TO	AP	AI	RE	NO
$\frac{4}{n-1}$	$\frac{6b^2}{b+5}$	$\frac{3b}{b-5}$	$\frac{n+2}{n-3}$	$\frac{b+7}{2(b+3)}$	2	$\frac{n+9}{n+2}$	$\frac{b+4}{2b+1}$	$\frac{b+2}{2b-1}$	$\frac{x+4}{x-9}$
LG	TE	BR	AT	RY	BI	DO	OR	TE	AT
$\frac{x+4}{x-2}$	$1\frac{1}{7}$	$2\frac{2}{5}$	$\frac{n+2}{n-1}$	$1\frac{1}{n}$	$\frac{x+5}{3}$	$\frac{3}{2(b-5)}$	$\frac{3}{2(b+10)}$	$\frac{n-4}{n+1}$	$x-2$

--	--	--	--	--	--	--	--	--	--

# CRYPTIC QUIZ

1. What do you call a skydiver with the flu?

3 12 6 11 9 11 2 10 8 5 1

2. How do you crash a houseboat party?

7 10 12 8 14 3 1 13 5 6 4

Simplify each expression below. 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.

①  $\frac{x+3}{9-x^2}$

②  $\frac{49-x^2}{x-7}$

③  $\frac{5x-20}{4-x}$

④  $\frac{-x^2+8x-12}{x-2}$

⑤  $\frac{x^2-2x-15}{10-2x}$

⑥  $\frac{-x^2+8x-16}{3x^2-12x}$

⑦  $\frac{-x^2-3x+10}{25-x^2}$

⑧  $-(x-6)$

⑨  $-(x+7)$

⑩  $-5$

⑪  $-\frac{x+5}{x-2}$

⑫  $\frac{x-2}{x-5}$

⑬  $-\frac{1}{x-3}$

⑭  $\frac{x-4}{6x}$

⑮  $-\frac{x+3}{2}$

⑯  $-\frac{x-4}{3x}$

⑰  $\frac{6-5c-c^2}{7c^2-7}$

⑱  $\frac{-c^2+6c-9}{c^2+5c-24}$

⑲  $\frac{-10c^3-5c^2}{2c^2+15c+7}$

⑳  $\frac{c^2-d^2}{c+d}$

㉑  $\frac{-c^2+2cd+3d^2}{5c-15d}$

㉒  $\frac{c^2d+4cd^2}{-c^2+16d^2}$

㉓  $\frac{-3c^2+6cd}{-3c^2+7cd-2d^2}$

⑳  $-(c+2d)$

㉑  $c-d$

㉒  $c-2d$

㉓  $-\frac{c-3}{c+8}$

㉔  $\frac{3c}{3c-d}$

㉕  $-\frac{c+d}{5}$

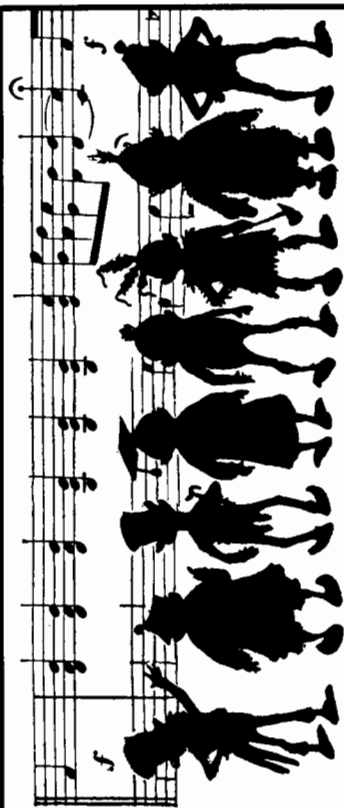
㉖  $-\frac{c+6}{7(c+1)}$

㉗  $-\frac{cd}{c-4d}$

㉘  $-\frac{5c^2}{c+7}$

# What Do You Call an Insect That Plays Drums?

Simplify each expression. Find your answer below and print the letter of that exercise above it.



(T)  $\frac{6a^5b^4}{9a^3b^7}$

(C)  $\frac{12a^5b^3(3-b)}{4a^4b(b^2+b-12)}$

(C)  $\frac{15a^2b^6}{25a^7b}$

(I)  $\frac{6a^2-30a+36}{4a-12}$

(I)  $\frac{a^5b^2(a^2+7a+10)}{a^2b^4(a+5)}$

(Y)  $\frac{a^3-49a}{a^3+7a^2}$

(T)  $\frac{a^2b-7a^2}{a^5}$

(H)  $\frac{3ab^3(a-1)}{6a^4b^4(1-a)}$

(K)  $\frac{2a^2b^2+4ab^2}{a^4b+4a^3b}$

(H)  $\frac{8a^2b-8b^3}{6a^2b+12ab^2+6b^3}$

(A)  $\frac{ab^6(a^2-2a-15)}{a^7b^5(5-a)}$

(M)  $\frac{3a^3(16-a^2)}{12a^6(a^2-9a+20)}$

(R)  $\frac{(b-5)^3}{15+7b-2b^2}$

$\frac{b(a+3)}{a^6}$

$\frac{a-4}{4a^2(a+5)}$

$\frac{(b-5)^2}{2b+3}$

$\frac{1}{2a^3b}$

$\frac{a}{a-7}$

$\frac{2a^2}{3b^3}$

$\frac{4(a-b)}{3(a+b)}$

$\frac{a+4}{4a^3(a-5)}$

$\frac{a^3(a+2)}{b^2}$

$\frac{3ab^2}{b+4}$

$\frac{4(a+b)}{3(2a-b)}$

$\frac{b-7}{a^3}$

$\frac{3(a-2)}{2}$

$\frac{3b^5}{5a^5}$

$\frac{2b(a+2)}{a^2(a+4)}$

# ◆ BOOKS NEVER WRITTEN ◆

Everybody Needs Insurance by

$\frac{\quad}{9}$   $\frac{\quad}{3}$   $\frac{\quad}{12}$   $\frac{\quad}{1}$   $\frac{\quad}{8}$   $\frac{\quad}{11}$   $\frac{\quad}{6}$   $\frac{\quad}{2}$   $\frac{\quad}{12}$   $\frac{\quad}{10}$

Rock 'n Roll Your Baby by

$\frac{\quad}{5}$   $\frac{\quad}{10}$   $\frac{\quad}{12}$   $\frac{\quad}{7}$   $\frac{\quad}{2}$   $\frac{\quad}{11}$   $\frac{\quad}{6}$   $\frac{\quad}{10}$

50 Years in the Navy by

$\frac{\quad}{8}$   $\frac{\quad}{8}$   $\frac{\quad}{12}$   $\frac{\quad}{10}$   $\frac{\quad}{4}$   $\frac{\quad}{4}$

ABOVE ARE THE TITLES OF THREE "BOOKS NEVER WRITTEN." TO DECODE THE NAMES OF THEIR AUTHORS:

Simplify each expression below. Find your answer and notice the letter next to it. Each time the exercise number appears in the code, write this letter above it.

①  $\frac{2x^2 - 18}{4x + 12}$

⑤  $\frac{-x^2 + 8x - 16}{x^3 - 4x^2}$

⑨  $\frac{4a^3b^4(a^2 + a - 42)}{28a^4b^4(6 - a)}$

②  $\frac{3x^2 - 24x + 36}{2x^2 - x - 6}$

⑥  $\frac{49x - x^3}{7 - 6x - x^2}$

⑩  $\frac{a^4 - 8a^3b}{a^3 - 64ab^2}$

③  $\frac{5x^2 - 25x}{3x^3 - 75x}$

⑦  $\frac{a^2 + 11ab + 18b^2}{a^2b + 9ab^2}$

⑪  $\frac{4a^2 + 8ab - 12b^2}{6a^2 - 12ab + 6b^2}$

④  $\frac{x^2 + 5x - 24}{3 - x}$

⑧  $\frac{15a^5b(5 - a)}{6a^2b^3(a - 5)}$

⑫  $\frac{10a^3b + 10a^2b}{4a^2b^3 + 2ab^3}$

Answers for exercises 1–6:

Ⓦ  $-\frac{x-4}{x-1}$

Ⓐ  $\frac{3(x-6)}{2x+3}$

Ⓤ  $\frac{5}{3(x+5)}$

Ⓡ  $-(x+8)$

Ⓣ  $\frac{x-3}{2}$

Ⓜ  $\frac{x(x-7)}{x+2}$

Ⓒ  $\frac{x(x-7)}{x-1}$

Ⓛ  $-\frac{x-4}{x^2}$

Answers for exercises 7–12:

Ⓝ  $-\frac{a+7}{7a}$

Ⓝ  $\frac{2(a+3b)}{3(a-b)}$

Ⓟ  $\frac{2(a-3b)}{3(a+b)}$

ⓓ  $\frac{a+2b}{ab}$

Ⓛ  $-\frac{5a^3}{2b^2}$

Ⓢ  $\frac{5a(a+1)}{b^2(2a+1)}$

ⓔ  $\frac{a^2}{a+8b}$

Ⓑ  $-\frac{a-7}{7ab}$

# What Do You Call a Message

## Printed on a Lion With Chickenpox ?



Express each product in simplest form. Find your answer below and notice the letter next to it. Write this letter in each box containing the number of that exercise.

$$\textcircled{1} \frac{x^3}{2y^2} \cdot \frac{6y^4}{xy}$$

$$\textcircled{6} \frac{13xy^2}{x^2 + 3x - 18} \cdot \frac{x^2 - 9}{26x^4y^2}$$

$$\textcircled{2} \frac{5xy^2}{4x^2} \cdot \frac{8x^3y}{15y^5}$$

$$\textcircled{7} \frac{25 - x^2}{14x^3y^8} \cdot \frac{7x^2y}{8x + 40}$$

$$\textcircled{3} \frac{x^2 + 7x + 12}{x - 5} \cdot \frac{2x - 10}{x + 3}$$

$$\textcircled{8} \frac{2x^2 + 5x - 7}{x + 4} \cdot \frac{x^2 + 4x}{x^2 - 2x + 1}$$

$$\textcircled{4} \frac{x^2 - 3x - 10}{x + 7} \cdot \frac{3x + 21}{6x - 30}$$

$$\textcircled{9} \frac{2x + 10}{32 - 8x} \cdot \frac{x^2 - 10x + 24}{x^2 - x - 30}$$

$$\textcircled{5} \frac{x - 1}{4xy^3} \cdot \frac{6x^2y}{1 - x}$$

$$\textcircled{10} \frac{12x + 48}{6x - 15} \cdot \frac{4x^2 - 25}{x^2 + 9x + 20}$$

$$\textcircled{G} -\frac{3x}{2y^2}$$

$$\textcircled{O} \frac{4(2x + 5)}{x + 5}$$

$$\textcircled{L} \frac{x + 3}{2x^3(x + 6)}$$

$$\textcircled{F} -\frac{x - 4}{x + 4}$$

$$\textcircled{H} 3x^2y$$

$$\textcircled{T} -\frac{1}{4}$$

$$\textcircled{D} \frac{2x^2}{3y^2}$$

$$\textcircled{I} \frac{x + 2}{2}$$

$$\textcircled{E} 2(x + 4)$$

$$\textcircled{N} \frac{x(2x + 7)}{x - 1}$$

$$\textcircled{S} -\frac{x - 5}{16xy^7}$$

$$\textcircled{A} \frac{4(2x - 5)}{3(x + 4)}$$

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

# Why Are Ancient Stories Like Feet?

Express each product below in simplest form. Find your answer in the answer column and notice the two letters next to it. Write these letters in the two boxes at the bottom of the page that contain the number of that exercise.

$$① \frac{a^2 - b^2}{a^4 b} \cdot \frac{ab^2}{3a + 3b}$$

$$② \frac{4 - a}{5a} \cdot \frac{a^2 + 5a}{a^2 + a - 20}$$

$$③ \frac{a^2 + 5ab + 6b^2}{a^2 - 5ab + 6b^2} \cdot \frac{10a - 30b}{5a + 10b}$$

$$④ \frac{3a^2 b - ab^2}{6a} \cdot \frac{9a^2}{9a^2 - b^2}$$

$$⑤ \frac{2a^2 - 13a + 15}{8a^2 - 12a} \cdot \frac{6a - 4a^2}{a^2 - 10a + 25}$$

$$⑥ \frac{-a^3 + ab^2}{a^2} \cdot \frac{a^3 + 7a^2 b}{a^2 + 6ab - 7b^2}$$

$$⑦ \frac{6a + 24}{2a^2 + 5a - 12} \cdot \frac{4a^2 - 9}{15a^2}$$

$$⑧ \frac{8a - 40}{40 - 3a - a^2} \cdot \frac{a - 8}{2a^2 - 8a}$$

$$⑨ \frac{27a^4 b^7}{3a^2 - 6a + 3} \cdot \frac{(a - 1)^3}{9ab^3}$$

$$\textcircled{\text{ES}} \quad 3a^3 b(a - 1)$$

$$\textcircled{\text{OT}} \quad -a(a + b)$$

$$\textcircled{\text{EG}} \quad a^3 b^4(a - 1)$$

$$\textcircled{\text{HL}} \quad \frac{3a^2 b}{2(3a + b)}$$

$$\textcircled{\text{EB}} \quad \frac{b(a - b)}{3a^3}$$

$$\textcircled{\text{TS}} \quad -\frac{4(a - 8)}{4a - 8}$$

$$\textcircled{\text{DS}} \quad -\frac{4(a - 8)}{a(a + 8)(a - 4)}$$

$$\textcircled{\text{TH}} \quad \frac{2(a + 3b)}{a - 2b}$$

$$\textcircled{\text{AR}} \quad \frac{2(2a + 3)}{5a^2}$$

$$\textcircled{\text{EN}} \quad -\frac{1}{5}$$

$$\textcircled{\text{EY}} \quad -\frac{2a - 3}{2(a - 5)}$$

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

## What Happened to the Peanut Who Went Walking Late at Night?

Express each quotient below in simplest form. Find your answer in the answer column and notice the letter next to it. Write this letter in each box containing the number of that exercise.

①  $\frac{12m^2n^5}{m+5} \div \frac{3m^3n}{m^2-25}$

②  $\frac{n^2-9n+20}{6m^7n^2} \div \frac{5n-20}{10mn^2}$

③  $\frac{m^2}{m^2-7m} \div \frac{1}{m^2-4m-21}$

④  $\frac{16-2m}{m^2+2m-24} \div \frac{m-8}{3m+18}$

⑤  $\frac{12n-36}{9-n^2} \div \frac{8n^5}{n^2+3n}$

⑥  $\frac{m^2-n^2}{m^2+2mn+n^2} \div \frac{m^2n-mn^2}{7m^2}$

⑦  $\frac{n^2-n-12}{2n^2-15n+18} \div \frac{3n^2-12n}{2n^3-9n^2}$

⑧  $\frac{17mn^3}{m^2+2m-35} \div \frac{34m^8n^4}{m^2+7m}$

⑨  $\frac{4n^3-25n}{3n^2-16n+5} \div (10n+25)$

Ⓜ  $7m(m-n)$

Ⓝ  $-3n^4(n-3)$

Ⓣ  $m(m+3)$

ⓓ  $-\frac{3}{2n^4}$

Ⓤ  $\frac{4n^4(m-5)}{m}$

Ⓡ  $\frac{1}{2m^4n(m-7)}$

Ⓢ  $\frac{n(2n-9)(n+3)}{3(2n-3)(n-6)}$

Ⓛ  $-\frac{6}{m-4}$

Ⓐ  $\frac{n(2n-5)}{5(3n-1)(n-5)}$

Ⓦ  $\frac{7m}{n(m+n)}$

Ⓛ  $\frac{1}{2m^6n(m-5)}$

Ⓔ  $\frac{n-5}{3m^6}$

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

# What Happens When the Smog Lifts in Los Angeles, California ?

Simplify each expression below and find your answer at the bottom of the page. Cross out the letter above each correct answer. When you finish, the answer to the title question will remain.

①  $\frac{9x}{x^2 - 25} \cdot \frac{x^2 + 5x}{2x - 4} \cdot \frac{x^2 + 3x - 10}{3x^4}$

②  $\frac{x + 4}{2x^2 - 14x} \cdot \frac{x^3 + 4x^2}{3x - 24} \div \frac{x^2 + 8x + 16}{x^2 - 3x - 28}$

③  $\frac{4x^2 - y^2}{x^2y - xy^2} \cdot \frac{x^2 + xy}{8x + 4y} \div \frac{2x^2 - 7xy + 3y^2}{8x^5y}$

④  $\frac{(2x - 5)^3}{3 - x} \div \frac{2x^2 - 3x - 5}{6x^2 + 15x} \cdot \frac{x^2 - 2x - 3}{4x^2 - 25}$

⑤  $\frac{x^4 - y^4}{3x^2y - 3xy^2} \div \frac{x^2 + 2xy + y^2}{9xy^3} \div \frac{4x^2 + 4y^2}{xy^2 + y^3}$

⑥  $(75x^2 - 12) \div \left( \frac{35 - 2x - x^2}{x^2 + 7x} \div \frac{x - 5}{5x^3 + 2x^2} \right)$



A	B	U	S	C	O	L	R	A	Y
$\frac{x(x+4)}{6(x-8)}$	$-\frac{3(5x-2)}{x}$	$\frac{2x^3(x+y)}{x-3y}$	$-3x(2x-5)$	$\frac{3y^3(x+y)}{4(x-y)}$	$\frac{3y^4}{4}$	$-3(2x-5)$	$\frac{3(x+5)}{2x^2(x-5)}$	$\frac{x(x+4)}{3(x-7)}$	$\frac{2x^5(x+y)}{(x-y)(x-3y)}$



# Why Does the U.S. Mint Need a New Building ?

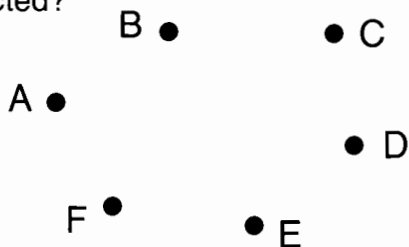
For each exercise below, use the clue to help unscramble the letters of the word in parentheses. Then write this word in the adjacent boxes. One or more of the boxes has a number. Whenever you write a letter in a numbered box, transfer that letter to the matching numbered box at the bottom of the page.

①	A symbol used to represent a number (BARELAVI).			15																			
②	A statement of equality (OUTNQEI).	9								20													
③	A value that satisfies an open sentence (LOUNSIOT).									17													
④	For all real numbers $a$ , $b$ , and $c$ : $a(b + c) = ab + ac$ (RIIUVESDBTT).	8																		6			
⑤	An equation that expresses a relationship between measurements (ARFLMOU).									2													
⑥	A number that is multiplied by a variable (EOFIETIFCNC).							21															
⑦	For a real number $a$ , the real number $-a$ (PESTOOIP).																		23	12			
⑧	For a nonzero real number $a$ , the real number $\frac{1}{a}$ (CLERIRACPO).									14													
⑨	To express as a product of two or more quantities (OFCRTA).																			1			
⑩	A product in which all the factors are the same (EORPW).																			5	22		
⑪	A sum of monomials (PMALONOILY).																				18		
⑫	A polynomial with two terms (IAMNILBO).																				10		
⑬	A polynomial whose greatest monomial factor is 1 (MREIP).																				3	11	
⑭	The set of whole numbers and their opposites (EENSIGRT).																				7	4	
⑮	A polynomial equation of degree two (DUCATARQI).																				16	19	13
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	

# TEST OF GENIUS

- ① The land of Euclidia has six remote towns, which we shall call A, B, C, D, E, and F. Unfortunately, not all the towns are connected by telephone lines. Town A is connected to all the other five towns, but Town B is connected to only four. Town C, too, is connected to four; whereas D, E, and F are each connected to only three towns.

There is a line from Town D to Town F. To what towns is Town E connected?

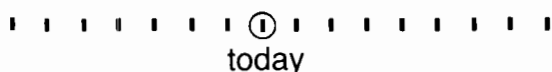


- ② In the following multiplication problem, the letters A, B, C, and D represent four different digits. What digit should replace each letter?

$$\begin{array}{r} ABCD \\ \times 4 \\ \hline DCBA \end{array}$$

- ③ On what day of the week was the following statement made:

When the day before yesterday was referred to as "the day after tomorrow," the day that was then called "yesterday" was as far away from today as today is from next Saturday. (HINT: Use the diagram below.)



- ④ A clock loses ten minutes each hour. If the clock is set correctly at 12 o'clock noon, what is the correct time when the clock reads 3:00 P.M.?

- ⑤ How tall is a tree which is 15 feet shorter than a pole that is three times as tall as the tree?

- ⑥ Rollo, Gorgo, and Zed work in the circus. They are the ringmaster, lion tamer, and clown, though not necessarily in that order.

1. Zed has red hair.
2. Rollo has curly hair.
3. The ringmaster is shorter than Rollo.
4. The lion tamer is bald.

Who is the clown?

- ⑦ Three men, A, B, and C, were traveling with their wives, a, b, and c. They came to a river which they had to cross. There was just one boat and only two could cross at one time. Since the husbands were jealous, no woman could be left with a man unless her husband were also present. How did they get across the river?



- ⑧ Find the number that logically continues each of these series:

- a) 2, 3, 5, 9, 17, \_\_\_\_\_
- b) 14, 19, 29, 40, 44, 52, \_\_\_\_\_

## SCORING KEY

- 7 or 8—*Extra Extraordinary Genius*  
 5 or 6—*Extraordinary Genius*  
 3 or 4—*Ordinary Genius*  
 1 or 2—*Ex-Genius*

# What Unusual Accident Happened to Brainless Flunkalot?



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

①  $\frac{2}{5x} + \frac{7}{5x} + \frac{3}{5x}$

⑤  $\frac{x^2}{3x+15} - \frac{25}{3x+15}$

⑨  $\frac{x}{x^2+4x-21} + \frac{7}{x^2+4x-21}$

②  $\frac{4}{2x} - \frac{5}{2x} + \frac{9}{2x}$

⑥  $\frac{x^2}{5x+40} + \frac{8x}{5x+40}$

⑩  $\frac{3x}{x^2-9x+20} - \frac{12}{x^2-9x+20}$

③  $\frac{8x}{x-4} + \frac{3x}{x-4}$

⑦  $\frac{x+5}{9} + \frac{5x+7}{9}$

⑪  $\frac{x^2}{x^2-4} + \frac{7x-18}{x^2-4}$

④  $\frac{x^2}{x-7} - \frac{49}{x-7}$

⑧  $\frac{4x+1}{4x} + \frac{6x-11}{4x}$

⑫  $\frac{2x^2-x}{(x-3)^2} - \frac{15}{(x-3)^2}$

Ⓡ  $\frac{4}{x}$

ⓔ  $\frac{x-3}{x-5}$

Ⓤ  $\frac{5(x-1)}{2x}$

Ⓜ  $\frac{x}{5}$

ⓓ  $\frac{3(x+2)}{2x}$

ⓖ  $\frac{12}{5x}$

Ⓣ  $\frac{2x+5}{x-3}$

Ⓒ  $\frac{x-5}{3}$

Ⓝ  $\frac{2x-1}{x-3}$

ⓐ  $x+7$

Ⓚ  $\frac{2(x+2)}{3}$

ⓗ  $\frac{3}{x-5}$

Ⓢ  $\frac{x+9}{x+2}$

Ⓞ  $\frac{1}{x-3}$

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

# What Lives in the Sea and Yells?



Express each sum below in simplest form. Cross out the box containing your answer. When you finish, print the letters from the remaining boxes in the spaces at the bottom of the page.

①  $\frac{3n}{7} + \frac{n}{14}$

②  $\frac{4n}{15} + \frac{2n}{5}$

③  $\frac{5n}{3} + \frac{7}{4} + \frac{11n}{12}$

④  $\frac{4n+7}{6} + \frac{3n-1}{2}$

⑤  $\frac{2n-6}{5} + \frac{n-3}{10}$

⑥  $\frac{5n}{4} + \frac{n}{6} + \frac{7n}{12}$

⑦  $\frac{3x-2}{6x} + \frac{5x+1}{9x}$

⑧  $\frac{6x+7}{15} + \frac{x-3}{10}$

⑨  $\frac{4x-1}{3x} + \frac{x-8}{5x}$

⑩  $\frac{5x+1}{3x} + \frac{3x+4}{2x} + \frac{x+2}{6x}$

⑪  $\frac{4x+2}{5x} + \frac{10x-1}{20x} + \frac{2x-3}{4x}$

⑫  $\frac{2x-1}{5} + \frac{x}{6} + \frac{8-3x}{10}$

FI	TH	AC	ES	AN	LA	ND	SH	MS
$2n$	$\frac{n}{2}$	$\frac{3n-9}{5}$	$\frac{13n+4}{6}$	$\frac{4x+9}{15}$	$\frac{6x+11}{30}$	$\frac{3x+1}{6}$	$\frac{2(5x+4)}{3x}$	$\frac{8x-7}{10x}$
EA	HO	OF	RN	UT	ME	YE	ER	LL
$\frac{2n}{3}$	$\frac{19n+8}{6}$	$\frac{31n+21}{12}$	$\frac{n-3}{2}$	$\frac{13x+9}{6x}$	$\frac{9x-2}{5x}$	$\frac{19x-4}{18x}$	$\frac{21x-17}{15x}$	$\frac{23x-29}{15x}$

\_\_\_\_\_

# Why Did Orgo Take a Bath After Walking Through Mudsucker Swamp?



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

$$\textcircled{1} \quad \frac{5}{x} + \frac{2}{x^2}$$

$$\textcircled{2} \quad \frac{3}{2x^2} + \frac{7}{6x}$$

$$\textcircled{3} \quad \frac{1}{3x} + \frac{5}{4x^3}$$

$$\textcircled{4} \quad \frac{-4}{x^3} + \frac{9}{x} + \frac{2}{x^2}$$

$$\textcircled{5} \quad \frac{7}{10x^2} + \frac{1}{2x^3} + \frac{11}{5x}$$

Answers:

$$\textcircled{U} \quad \frac{2x^2 + 5}{12x^3}$$

$$\textcircled{B} \quad \frac{11x^2 + x + 15}{5x^3}$$

$$\textcircled{S} \quad \frac{5x + 2}{x^2}$$

$$\textcircled{E} \quad \frac{9x^2 + 2x - 4}{x^3}$$

$$\textcircled{M} \quad \frac{22x^2 + 5x + 10}{10x^3}$$

$$\textcircled{I} \quad \frac{22x^2 + 7x + 5}{10x^3}$$

$$\textcircled{Y} \quad \frac{7x + 9}{6x^2}$$

$$\textcircled{C} \quad \frac{3x + 14}{6x^2}$$

$$\textcircled{A} \quad \frac{4x^2 + 15}{12x^3}$$

$$\textcircled{O} \quad \frac{9x^2 - 4x + 4}{x^3}$$

# Why Do Helicopters Get Sick So Often?



Express each sum below in simplest form. Find your answer and notice the three letters next to it. Write these letters in the three boxes at the bottom of the page that contain the number of that exercise.

$$\textcircled{1} \quad \frac{7}{x-3} + \frac{4}{x^2-9}$$

$$\textcircled{4} \quad \frac{m}{m+5} + \frac{10m}{m^2-25}$$

$$\textcircled{7} \quad \frac{3}{a+2} + \frac{8}{a-5}$$

$$\textcircled{2} \quad \frac{x}{x+5} + \frac{7x+10}{x^2+5x}$$

$$\textcircled{5} \quad \frac{2}{m+3} + \frac{9}{m^2+8m+15}$$

$$\textcircled{8} \quad \frac{6}{a^2-4} + \frac{2}{a+2} + \frac{5}{a-2}$$

$$\textcircled{3} \quad \frac{x-20}{x^2-4x} + \frac{x}{x-4}$$

$$\textcircled{6} \quad \frac{11m}{m^2+3m-28} + \frac{m}{m+7}$$

$$\textcircled{9} \quad \frac{2}{a-3} + \frac{7}{a^2+a-12} + \frac{1}{a+4}$$

$$\textcircled{\text{COP}} \quad \frac{3m}{m+7}$$

$$\textcircled{\text{NTT}} \quad \frac{9a+4}{(a+2)(a-5)}$$

$$\textcircled{\text{ICK}} \quad \frac{11m+2}{(m+3)(m+5)}$$

$$\textcircled{\text{BIR}} \quad \frac{m}{m-4}$$

$$\textcircled{\text{THE}} \quad \frac{x+2}{x}$$

$$\textcircled{\text{HAT}} \quad \frac{4a+9}{(a-3)(a+4)}$$

$$\textcircled{\text{EST}} \quad \frac{x+5}{x}$$

$$\textcircled{\text{DCA}} \quad \frac{7x+25}{(x+3)(x-3)}$$

$$\textcircled{\text{RLY}} \quad \frac{7a+12}{(a+2)(a-2)}$$

$$\textcircled{\text{ERM}} \quad \frac{2m+19}{(m+3)(m+5)}$$

$$\textcircled{\text{TCH}} \quad \frac{11a+1}{(a+2)(a-5)}$$

$$\textcircled{\text{TES}} \quad \frac{5a+14}{(a+2)(a-2)}$$

$$\textcircled{\text{WHI}} \quad \frac{m}{m-5}$$

$$\textcircled{\text{ENT}} \quad \frac{x-1}{x}$$

$$\textcircled{\text{HEL}} \quad \frac{2m}{m+5}$$

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

# WHY ISN'T A SNOWMAN VERY SMART?

Express each difference below in simplest form. Find your answer and notice the letter next to it. Write this letter in each box containing the number of that exercise.

$$\textcircled{1} \frac{8}{x^2 - 4} - \frac{3}{x - 2}$$

$$\textcircled{2} \frac{9}{x^2 - 2x - 15} - \frac{2}{x + 3}$$

$$\textcircled{3} \frac{7x}{x^2 - 9x + 14} - \frac{4}{x - 7}$$

$$\textcircled{4} \frac{3}{x - 4} - \frac{x - 9}{x^2 - 16}$$

$$\textcircled{5} \frac{5}{x + 5} - \frac{2x + 5}{x^2 + 9x + 20}$$

$$\textcircled{6} \frac{3}{d - 7} - \frac{2}{3d + 1}$$

$$\textcircled{7} \frac{8}{5d + 4} - \frac{1}{2d - 3}$$

$$\textcircled{8} \frac{d + 2}{4d - 1} - \frac{7}{d + 5}$$

$$\textcircled{9} \frac{d^2 + 3}{d^2 - 2d} - \frac{d - 4}{d}$$

$$\textcircled{10} \frac{d^2 - 11}{d^2 - 7d + 12} - \frac{d + 1}{d - 4}$$

Answers:

$$\textcircled{L} \frac{3x}{x + 5}$$

$$\textcircled{A} \frac{-2x + 19}{(x + 3)(x - 5)}$$

$$\textcircled{I} \frac{3}{x + 4}$$

$$\textcircled{U} \frac{2x + 3}{(x - 2)(x - 7)}$$

$$\textcircled{O} \frac{-3x + 2}{(x + 2)(x - 2)}$$

$$\textcircled{W} \frac{2x + 21}{(x + 4)(x - 4)}$$

$$\textcircled{E} \frac{3x + 8}{(x - 2)(x - 7)}$$

$$\textcircled{C} \frac{7x + 11}{(x + 3)(x - 5)}$$

Answers:

$$\textcircled{Y} \frac{3d + 8}{d(d - 2)}$$

$$\textcircled{P} \frac{8d - 15}{(5d + 4)(2d - 3)}$$

$$\textcircled{S} \frac{2}{d - 3}$$

$$\textcircled{H} \frac{7d + 17}{(d - 7)(3d + 1)}$$

$$\textcircled{N} \frac{d^2 - 21d + 17}{(4d - 1)(d + 5)}$$

$$\textcircled{T} \frac{d^2 - 18d + 4}{(4d - 1)(d + 5)}$$

$$\textcircled{R} \frac{6d - 5}{d(d - 2)}$$

$$\textcircled{B} \frac{11d - 28}{(5d + 4)(2d - 3)}$$

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

Answers A–E:

$\frac{11a - 15}{2a - 3}$	SCHOOL
$\frac{-29a - 21}{5a + 2}$	DECIDED
$\frac{8a + 17}{a + 4}$	BOLD
$\frac{2a + 5}{a}$	THE
$\frac{-3(2a - 3)}{3a - 1}$	WHO
$\frac{3a + 20}{a + 4}$	DRIVING
$\frac{-27a - 16}{5a + 2}$	WANTED
$\frac{13a - 12}{2a - 3}$	TEACHER
$\frac{-a + 10}{3a - 1}$	FROM

# Did You Hear About...

A	B	C	D	E
F	G	H	I	J
				?

Express each sum or difference below in simplest form. Find your answer in the appropriate answer column and notice the word beneath it. Write this word in the box containing the letter of that exercise.

(A)  $\frac{5}{a} + 2$

(F)  $\frac{3x + 1}{x^2 + 10} + 4$

(B)  $\frac{8}{a + 4} + 3$

(G)  $\frac{5}{x^2 - 9} + \frac{2}{x - 3} + 1$

(C)  $4 + \frac{5a}{2a - 3}$

(H)  $\frac{x}{x + 2} + \frac{x}{x - 2} - 5$

(D)  $\frac{7}{3a - 1} - 2$

(I)  $\frac{10}{x - 3} - \frac{10}{x + 5} + 2$

(E)  $\frac{a - 9}{5a + 2} - 6$

(J)  $3 - \frac{2x}{x - 2} - \frac{5x}{x - 5}$

Answers F–J:

$\frac{2x^2 + 4x + 50}{(x - 3)(x + 5)}$	THE
$\frac{x^2 + 5x + 30}{x^2 + 10}$	THAT
$\frac{x^2 + 2x + 2}{(x + 3)(x - 3)}$	GRADE
$\frac{-3(7x - 10)}{(x - 2)(x - 5)}$	CURVE
$\frac{x^2 + 6x - 30}{(x - 3)(x + 5)}$	HIGHWAY
$\frac{4x^2 + 3x + 41}{x^2 + 10}$	TO
$\frac{3x^2 + x - 3}{(x + 3)(x - 3)}$	CRASH
$\frac{-3x^2 + 20}{(x + 2)(x - 2)}$	ON
$\frac{-5x^2 + 12}{(x + 2)(x - 2)}$	SOME



# How Did the Hunter Get Hurt While Bending Over to Study Some Tracks?

Divide and write your answer as a polynomial or mixed expression. Cross out the box containing your answer. When you finish, write the letters from the remaining boxes in the spaces at the bottom of the page.

①  $\frac{x^2 + 8x + 15}{x + 5}$

④  $\frac{x^2 - x + 12}{x - 6}$

⑦  $\frac{x^2 + 4}{x - 3}$

②  $\frac{2x^2 + 3x - 14}{x - 2}$

⑤  $\frac{3x^2 - 5x - 11}{x + 1}$

⑧  $\frac{2x^2 - 3x - 1}{2x + 1}$

③  $\frac{x^2 - 5x + 8}{x - 3}$

⑥  $\frac{x^2 + 1 + 8x}{x + 4}$

⑨  $\frac{6x^2 - 7x + 5}{3x - 5}$

TH	HE	AT	ST	SH
$x - 2 + \frac{2}{x - 3}$	$x + 3 + \frac{13}{x - 3}$	$2x + 2 + \frac{6}{3x - 5}$	$x + 5 + \frac{42}{x - 6}$	$2x + 1 + \frac{10}{3x - 5}$
RA	SK	OT	IN	HI
$x - 3 + \frac{3}{2x + 1}$	$x + 3$	$x - 2 + \frac{1}{2x + 1}$	$3x - 6 - \frac{5}{x + 1}$	$x + 4 + \frac{9}{x - 3}$
BE	TH	HU	NT	IM
$3x - 8 - \frac{3}{x + 1}$	$x + 2 - \frac{11}{x + 4}$	$2x + 7$	$x + 4 - \frac{15}{x + 4}$	$x + 7 + \frac{33}{x - 6}$

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# What Do They Call People Who Like to Turn the Lights On and Off?

Divide and write your answer as a polynomial or mixed expression. Find your answer below and notice the letter next to it. Write this letter in each box that contains the number of that exercise.

$$\textcircled{1} \frac{4x^2 - 4x + 3}{2x - 5}$$

$$\textcircled{5} \frac{x^3 - 8}{x - 2}$$

$$\textcircled{2} \frac{2x^2 - 20}{x + 3}$$

$$\textcircled{6} \frac{x^3 + 9x^2 - 80}{x + 4}$$

$$\textcircled{3} \frac{x^3 + 5x^2 + 4x - 4}{x + 2}$$

$$\textcircled{7} \frac{6a^2 + 5ab - 5b^2}{2a - b}$$

$$\textcircled{4} \frac{1 - 7x^2 + 6x^3 + 17x}{3x - 2}$$

$$\textcircled{8} \frac{a^3 + 4a^2b + ab^2 - 2b^3}{a + b}$$

$$\textcircled{D} x^2 + 2x - 7$$

$$\textcircled{H} x^2 + 5x - 20$$

$$\textcircled{T} a^2 + 3ab - 2b^2$$

$$\textcircled{I} x^2 + 3x - 2$$

$$\textcircled{S} x^2 + 2x + 4$$

$$\textcircled{O} x^2 + 5x - 18$$

$$\textcircled{N} 2x - 6 + \frac{7}{x + 3}$$

$$\textcircled{C} 2x + 3 + \frac{18}{2x - 5}$$

$$\textcircled{E} 2x^2 - x + 5 + \frac{11}{3x - 2}$$

$$\textcircled{U} 2x^2 - x - 5 + \frac{4}{3x - 2}$$

$$\textcircled{A} 3a + 2b - \frac{8b^2}{2a - b}$$

$$\textcircled{W} 3a + 4b - \frac{b^2}{2a - b}$$

$$\textcircled{R} 2x - 6 - \frac{2}{x + 3}$$

$$\textcircled{M} a^2 + 3ab - b^2 + \frac{5b^3}{a + b}$$

5

7

3

8

1

6

6

3

8

8

4

2

5

# How Do We Know That Clocks Are Hungry?



For each exercise below, find the ratio or the rate as directed. Write the letter of the exercise in the box containing your answer.



For each exercise below, express both measurements in the same unit. Then give their ratio as a fraction in simplest form.

- |   |   |  |
|---|---|--|
| <p>(S) 20 sec to 2 min</p> <p>(A) 3 h to 40 min</p> <p>(O) 75¢ to \$2</p> <p>(H) 35 cm to 20 cm</p> <p>(E) 60 cm to 4 m</p> <p>(D) 1 kg to 250 g</p> <p>(Y) 400 m to 5 km</p> <p>(A) 96 people to 60 people</p> | <p>(W) The ratio of students to teachers in a school with 1200 students and 50 teachers.</p> <p>(E) The ratio of men to women at a college with 1500 men and 1800 women.</p> <p>(T) The ratio of tin to copper in an alloy that contains 48 kg of copper and 32 kg of tin.</p> <p>(A) The ratio of wins to losses in 40 games with 15 losses and no ties.</p> <p>(S) The ratio of advertising time to nonadvertising time in a one-hour TV show that includes 8 minutes of ads.</p> <p>(E) The ratio of the area of a rectangle with sides 8 cm and 12 cm to the area of a square with sides 10 cm.</p> | <p>(V) A car traveled 500 miles on 25 gallons of gas. (miles per gallon)</p> <p>(Y) Frank typed 90 words in 4 minutes. (words per minute)</p> <p>(S) A jet traveled 1000 miles in 2.5 hours. (miles per hour)</p> <p>(L) A gear revolved 480 times in 15 minutes. (revolutions per minute)</p> <p>(N) Juan ran 600 meters in 1 minute 20 seconds. (meters per second)</p> <p>(H) Osgood ate 9 hamburgers in half an hour. (hamburgers per minute)</p> <p>(C) Mary Thon ran 26 miles in 2 hours 40 minutes. (minutes per mile to the nearest tenth)</p> |
|---|---|--|

$\frac{2}{3}$	$\frac{7}{4}$	$\frac{24}{25}$	$\frac{2}{25}$	$\frac{9}{2}$	32	$\frac{24}{1}$	$\frac{5}{3}$	22.5	$\frac{1}{6}$	0.3	$\frac{8}{5}$	20	$\frac{3}{20}$	400	$\frac{5}{6}$	6.2	$\frac{3}{8}$	7.5	$\frac{4}{1}$	$\frac{2}{13}$
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# Did the Farmer Hurt Any Cows When He Lost Control of His Tractor?



Solve each problem below. Find your answer in the answer column and notice the two letters next to it. Write these letters in the two boxes that contain the number of that exercise.



① Two numbers are in the ratio 5 : 2 and their sum is 56. Find the numbers.  
 \_\_\_\_\_ , \_\_\_\_\_

② Find two numbers whose ratio is 3 : 7 and whose sum is 150.  
 \_\_\_\_\_ , \_\_\_\_\_

③ A certain color is made by blending red paint and blue paint in a 9 : 4 ratio. How many liters of each are needed to make 65 liters of this color?  
 \_\_\_\_\_ ℓ , \_\_\_\_\_ ℓ

④ A commission of \$1000 is to be divided between two people in a 3 : 5 ratio. How much should each person receive?  
 \$ \_\_\_\_\_ , \$ \_\_\_\_\_

⑤ Three numbers are in a 2 : 3 : 5 ratio and their sum is 70. Find the numbers.  
 \_\_\_\_\_ , \_\_\_\_\_ , \_\_\_\_\_

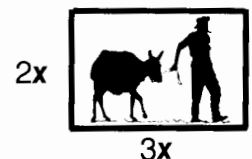
⑥ The sum of the angle measures of any triangle is  $180^\circ$ . Find the three angle measures of a triangle if they are in an 8 : 3 : 4 ratio.  
 \_\_\_\_\_  $^\circ$  , \_\_\_\_\_  $^\circ$  , \_\_\_\_\_  $^\circ$

⑦ A grass seed mixture contains bluegrass, ryegrass, and fescue seeds in a 4 : 3 : 1 ratio. How many ounces of each seed are contained in a 3 pound (48 ounce) box of the mix?  
 \_\_\_\_\_ oz , \_\_\_\_\_ oz , \_\_\_\_\_ oz

⑧ A market carries five flavors of ice cream. They sell in approximately a 2 : 2 : 3 : 6 : 7 ratio. How many cartons of each should be stocked if there is space for 80 cartons?  
 \_\_\_\_\_ , \_\_\_\_\_ , \_\_\_\_\_ , \_\_\_\_\_ , \_\_\_\_\_

⑨ The width and length of a rectangular poster are in a 2 : 3 ratio. The perimeter of the poster is 160 cm. Find its dimensions.  
 \_\_\_\_\_ cm , \_\_\_\_\_ cm

TH	48, 102
NO	24, 18, 6
EM	45, 20
NE	350, 650
ED	40, 16
LO	6, 6, 9, 18, 21
AZ	32, 48
TH	14, 21, 35
HE	45, 105
IF	26, 18, 4
GR	96, 36, 48
RU	98, 32, 50
JU	8, 8, 12, 24, 28
ST	375, 625
EW	30, 45



7	7	2	2	8	8	4	4	6	6	9	9	1	1	5	5	3	3
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# BOOKS NEVER WRITTEN

*Yours Forever* by

$$\frac{84}{5} \quad \frac{20}{3} \quad \frac{-3}{2} \quad \frac{-3}{2} \quad \frac{20}{3} \quad \frac{32}{3} \quad -12 \quad \frac{11}{4} \quad \frac{12}{7} \quad \frac{84}{5} \quad \frac{20}{3} \quad 15 \quad \frac{32}{3}$$

*The Incompetent Bullfighter* by

$$\frac{5}{8} \quad \frac{33}{16} \quad \frac{-43}{4} \quad \frac{11}{4} \quad \frac{33}{16} \quad -12 \quad \frac{38}{7} \quad \frac{-3}{2} \quad 21 \quad \frac{11}{4} \quad \frac{11}{4} \quad \frac{8}{9}$$

ABOVE ARE THE TITLES OF TWO "BOOKS NEVER WRITTEN." TO DECODE THE NAMES OF THEIR AUTHORS, FOLLOW THESE DIRECTIONS:

Solve each equation below and find the solution in the code. Each time the solution appears, write the letter of that exercise above it.

Ⓚ  $\frac{x}{6} = \frac{7}{2}$

ⓔ  $\frac{a}{8} = \frac{4}{3}$

Ⓨ  $\frac{2}{9} = \frac{t}{4}$

ⓐ  $\frac{8}{11} = \frac{3}{2y}$

ⓖ  $\frac{1}{6x} = \frac{4}{15}$

Ⓢ  $\frac{k+5}{7} = \frac{5}{3}$

ⓑ  $\frac{x-4}{2} = \frac{x+1}{9}$

Ⓝ  $\frac{7}{d+5} = \frac{10}{d+2}$

ⓐ  $\frac{x}{4} = \frac{2x+3}{15}$

Ⓜ  $\frac{21}{y-8} = 3$

Ⓡ  $\frac{17-4x}{12} = 5$

Ⓣ  $\frac{11u}{6} = u + 14$

ⓓ  $\frac{2n+3}{4} = \frac{5n-1}{6}$

Ⓛ  $\frac{15}{8x-3} = \frac{1}{2+2x}$

# Why Is a Good Grade in Algebra Like a Puppy in Antarctica ?



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

<b>1</b>	If there are 560 calories in 8 ounces of meat, how many calories are in 3 ounces of meat? _____ calories
<b>2</b>	If 2 cubic feet of sawdust weigh 25 pounds, how much do 9 cubic feet of sawdust weigh? _____ pounds
<b>3</b>	A certain hose delivers 5 gallons of water in 24 seconds. How much water will the hose deliver in 10 minutes? _____ gallons
<b>4</b>	The ratio of the weight of an object on Mars to its weight on Earth is 9 to 25. If a person weighs 120 pounds on Earth, how much would the person weigh on Mars? _____ pounds
<b>5</b>	A flagpole casts a shadow 8.5 meters long. If an algebra student 1.6 meters tall casts a shadow 2.0 meters long at the same time and location, how tall is the flagpole? _____ meters
<b>6</b>	A U.S. nickel is composed of 3.9 grams of copper and only 1.2 grams of nickel. How many kilograms of copper must be combined with 4 kilograms of nickel in the manufacture of nickel coins? _____ kilograms
<b>7</b>	At a certain college, the ratio of men to women is 6 to 5. If there are 2580 men, how many women are there? _____ women
<b>8</b>	In a town of 30,000 households, a survey was taken to estimate the number of households in which a certain TV program had been viewed. Of the 200 residences surveyed, the program had been seen in 64. Assuming that this was a representative sample, estimate the total number of households in the town in which the program was viewed. _____ households

PU	I	NA	PS	TS	A	DO
125	14.2	9600	43.2	8800	13	41.5
IT	GO	T	NI	OD	RA	CE
210	132	6.8	2230	112.5	2150	7.3

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