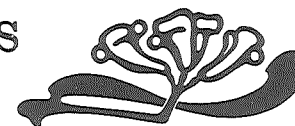


# Why Doesn't Gyro Bet on Even Numbers When Playing Roulette?



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

# 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...

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

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)  $x^2 + 5xy - 36y^2$

$(x - 18)(x + 1)$ 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

$(t + 3)(t - 2)$ 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

# 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  $n^2 + 6n + 5$  W

②  $n^2 + 7n + 10$  H

③  $n^2 - 7n + 12$  E

④  $n^2 - 11n + 28$  N

⑤  $n^2 + 2n - 15$  H

⑥  $n^2 - 5n - 24$  E

⑦  $n^2 + n - 56$  S

Answers:

(L)  $(n + 2)(n + 6)$

(H)  $(n + 5)(n - 3)$

(W)  $(n + 5)(n + 1)$

(E)  $(n - 3)(n - 4)$

(B)  $(n - 1)(n + 15)$

(S)  $(n + 8)(n - 7)$

(H)  $(n + 2)(n + 5)$

(E)  $(n - 8)(n + 3)$

(R)  $(n - 12)(n - 2)$

(N)  $(n - 7)(n - 4)$

⑧  $t^2 + 10t + 16$  I

⑨  $t^2 - 15t + 50$  T

⑩  $t^2 + 8t - 9$  S

⑪  $t^2 - 7t - 30$  O

⑫  $t^2 - t - 30$  N

⑬  $t^2 + 14t + 48$  T

⑭  $t^2 + 8t - 48$  H

Answers:

(N)  $(t - 6)(t + 5)$

(V)  $(t - 25)(t + 2)$

(T)  $(t - 5)(t - 10)$

(T)  $(t + 6)(t + 8)$

(O)  $(t - 10)(t + 3)$

(B)  $(t + 15)(t - 2)$

(I)  $(t + 8)(t + 2)$

(H)  $(t - 4)(t + 12)$

(S)  $(t + 9)(t - 1)$

(A)  $(t - 24)(t + 2)$

⑮  $a^2 + 5ab + 6b^2$  E

⑯  $a^2 - 4ab - 21b^2$  T

⑰  $a^2 + 6ab - 7b^2$  H

⑱  $a^2 - 14ab - 32b^2$  R

⑲  $a^2 - 29ab + 100b^2$  O

⑳  $a^2 + 7ab - 18b^2$  W

㉑  $a^2 + 2ab + b^2$  N

Answers:

(K)  $(a - 8b)(a + 4b)$

(H)  $(a + 7b)(a - b)$

(A)  $(a - 20b)(a + 5b)$

(E)  $(a + 2b)(a + 3b)$

(W)  $(a + 9b)(a - 2b)$

(T)  $(a - 7b)(a + 3b)$

(O)  $(a - 25b)(a - 4b)$

(S)  $(a + 6b)(a + 3b)$

(N)  $(a + b)(a + b)$

(R)  $(a - 16b)(a + 2b)$

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

When he sits on the thrown (throne).



## What Happened When the Boarding House Blew Up?

① $3x^2 + 7x + 2$ $(3x + 1)(x + 2)$	⑤ $(5u + 3)$	Y $(3u - 2)$
② $2x^2 + 5x + 3$ $(2x + 3)(x + 1)$	③ $(x - 1)$	E $(x - 5)$
③ $3x^2 - 16x + 5$ $(3x - 1)(x - 5)$	⑧ $(3x + 1)$	G $(8u - 1)$
④ $7x^2 - 9x + 2$ $(7x - 2)(x - 1)$	⑭ $(3u - 1)$	O $(7x - 2)$
⑤ $6u^2 + 5u + 1$ $(2u + 1)(3u + 1)$	⑥ $(2u + 3)$	R $(5u + 1)$
⑥ $8u^2 - 9u + 1$ $(8u - 1)(u - 1)$	⑮ $(x + 1)$	W $(x + 2)$
⑦ $10u^2 + 17u + 3$ $(2u + 3)(5u + 1)$	⑨ $(5u + 6)$	L $(7x + 2)$
⑧ $9u^2 - 9u + 2$ $(3u - 2)(3u - 1)$	⑦ $(2u + 1)$	I $(2x + 3)$
⑨ $5u^2 + 11u + 6$ $(5u + 6)(u + 1)$	⑪ $(3x - 1)$	E $(u + 1)$
	⑰ $(u - 1)$	S $(3u + 1)$

$$(10) \quad 3n^2 + 2n - 1 \quad (3n - 1)(n + 1)$$

⑪  $5n^2 - 4n - 1$   $(5n + 1)(n - 1)$

(12)  $2n^2 + 5n - 3$   $(2n - 1)(n + 3)$

(13)  $7n^2 - 13n - 2$   $(7n + 1)(n - 2)$

⑭  $3t^2 + 14t - 5 \quad (3t - 1)(t + 5)$

⑮  $4t^2 - 11t + 7$   $(4t - 7)(t - 1)$

⑩  $6t^2 + 5t - 1$      $(6t - 1)(t + 1)$

(17)  $3t^2 - 20t - 7 = (3t + 1)(t - 7)$

⑫  $(3t - 1)$

⑤  $(n - 1)$

④  $(3t + 1)$

⑩  $(n - 2)$

⑬  $(t + 1)$

②  $(3n - 1)$

⑩  $(2n - 1)$

④  $(3t - 7)$

$$\textcircled{1} \quad (4t - 7)$$

$$\textcircled{N} \quad (n + 3)$$

$$\textcircled{\text{R}} \quad (t-1)$$

$$\textcircled{\text{P}} \quad (2t + 1)$$

$$\odot (n+1)$$

$$\textcircled{\text{F}} \quad (t + 5)$$

Ⓔ  $(5n + 1)$

$$\textcircled{\text{M}} \quad (t - 7)$$

$$\textcircled{\text{R}} \quad (7n + 1)$$

$$\textcircled{\text{L}} \quad (6t - 1)$$

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
R	O	O	M	E	R	S	W	E	R	E	F	L	Y	I	N	G

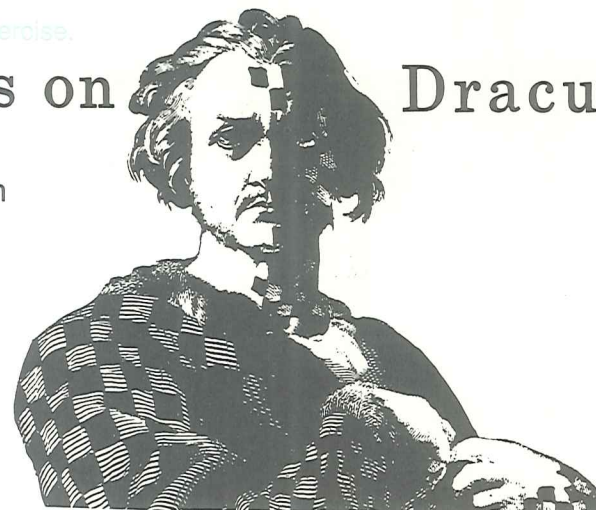
B-39

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

B-40

# What Do You Call Drawing Squares on Dracula?

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  $6x^2 + 19x + 3$   $(6x + 1)(x + 3)$

②  $5x^2 - 9x - 2$   $(5x + 1)(x - 2)$

③  $9x^2 + 15x + 4$   $(3x + 1)(3x + 4)$

④  $7x^2 + x - 8$   $(7x + 8)(x - 1)$

⑤  $2x^2 - 21x + 40$   $(2x - 5)(x - 8)$

⑥  $15m^2 + 19m + 6$   $(5m + 3)(3m + 2)$

⑦  $8m^2 - 5m - 3$   $(8m + 3)(m - 1)$

⑧  $4m^2 - 17m + 18$   $(4m - 9)(m - 2)$

⑨  $14m^2 + 17m - 22$   $(14m - 11)(m + 2)$

⑩  $3m^2 - m - 30$   $(3m - 10)(m + 3)$

BI (4m - 9)	TH (3x + 1)	TE (m - 2)	CH (m - 3)	OP (2x - 5)	AR (3m - 10)	AN (14m - 11)	EC (2m - 3)	HS (5x + 1)
SU (6x + 1)	KI (15m + 1)	LL (x + 3)	SS (m + 2)	NG (x + 4)	NE (5m + 3)	SU (x - 2)	CK (3m + 2)	AC (9x + 2)
AB (7x + 8)	EN (3x + 4)	OU (7x + 2)	GH (8m + 3)	PI (m + 3)	NT (7m + 2)	LO (x - 8)	VE (m - 1)	OD (x - 1)
C H E C K I N G A C O U N T								

Checking a count (account).

OBJECTIVE 3-o: To factor trinomials of the form  $ax^2 + bx + c$ , where  $a$  is a positive integer greater than 1.



NOTE: This puzzle is similar to the one on page 39. Students must find one factor in each column of binomials. The first answer is indicated in blue.

## How Can Fishermen Save Gas ?

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  $4n^2 - 49$   $(2n + 7)(2n - 7)$

②  $n^2 + 8n + 12$   $(n + 6)(n + 2)$

③  $n^2 - 9n + 20$   $(n - 4)(n - 5)$

④  $n^2 + 16n + 64$   $(n + 8)(n + 8)$

⑤  $n^2 + 2n - 15$   $(n + 5)(n - 3)$

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

③  $(n + 1)$

⑪  $(n + 2)$

②  $(n + 8)$

⑨  $(2n + 7)$

④  $(n + 5)$

⑱  $(n - 1)$

⑭  $(n - 4)$

①  $(n - 3)$

⑧  $(2n - 7)$

②  $(n - 5)$

⑤  $(3n - 5)$

④  $(n + 8)$

③  $(3n - 1)$

⑥  $(n + 6)$

⑦  $a^2 + 4a - 21$   $(a + 7)(a - 3)$

⑧  $5a^2 + 9a - 2$   $(5a - 1)(a + 2)$

⑨  $2a^2 + 11a + 15$   $(2a + 5)(a + 3)$

⑩  $1 - 9a^4$   $(1 - 3a^2)(1 + 3a^2)$

⑪  $a^2 - 11a + 30$   $(a - 5)(a - 6)$

⑫  $10a^2 - 3a - 1$   $(5a + 1)(2a - 1)$

①  $(a - 5)$

⑬  $(a + 7)$

⑤  $(5a + 1)$

⑦  $(a + 2)$

⑮  $(a - 1)$

⑧  $(1 - 3a^2)$

⑯  $(2a + 5)$

①  $(2a + 1)$

②  $(a - 6)$

③  $(a - 3)$

④  $(a + 3)$

⑤  $(5a - 1)$

⑥  $(2a - 1)$

⑦  $(1 + 3a^2)$

⑬  $8u^2 + 19u + 6$   $(8u + 3)(u + 2)$

⑭  $25u^2 - 20u + 4$   $(5u - 2)(5u - 2)$

⑮  $3u^2 - 11u - 14$   $(3u - 14)(u + 1)$

⑯  $u^2 - 4u - 21$   $(u + 3)(u - 7)$

⑰  $6u^2 + 17u - 10$   $(3u + 10)(2u - 1)$

⑱  $2u^2 + 5u - 18$   $(2u + 9)(u - 2)$

⑩  $(u + 3)$

⑫  $(2u + 9)$

⑰  $(u - 3)$

③  $(5u - 2)$

⑥  $(3u - 14)$

⑮  $(u + 2)$

⑰  $(3u + 10)$

①  $(u + 1)$

②  $(2u + 1)$

③  $(8u + 3)$

④  $(2u - 1)$

⑤  $(u - 7)$

⑥  $(u - 2)$

⑦  $(5u - 2)$

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

By forming carp pools (car pools).

# 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:

Ⓘ  $5x(x + 3)(x - 4)$

Ⓝ  $2x(2x + 3)(2x - 3)$

Ⓛ  $2x(x + 6)(x - 4)$

Ⓞ  $3(x - 2)(x - 3)$

ⓒ  $4(x + 5)(x - 3)$

Ⓐ  $x(x + 5)(x + 3)$

Ⓢ  $4(x + 5)(x - 1)$

Ⓔ  $x(x + 10)(x + 1)$

Ⓗ  $2x(x - 12)(x + 2)$

Ⓞ  $5x(x - 2)(x - 6)$

Ⓡ  $2x(4x + 9)(x + 1)$

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:

Ⓞ  $3m(5m + 3)(m + 1)$

Ⓢ  $5(3m + 1)(m - 5)$

Ⓡ  $(3m - 4)(m - 2)$

Ⓕ  $2(2m + 1)(m + 7)$

Ⓣ  $5(3m - 5)(m + 1)$

Ⓜ  $6m(5m - 1)(2m - 1)$

Ⓗ  $3m(5m + 2)(m - 1)$

Ⓝ  $2(2m - 7)(m - 1)$

Ⓟ  $2m(5m + 1)(5m - 1)$

ⓒ  $6m(10m - 1)(m + 1)$

Ⓛ  $(3m - 2)(m + 4)$

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 THE	B MAN	C WHO	D HUNTED	E BEAR
F UNTIL	G THE	H FOREST	I RANGER	J MADE
K HIM	L PUT	M ON	N CLOTHES	???

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

# 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 THE	B MAN	C WHO	D HUNTED	E BEAR
F UNTIL	G THE	H FOREST	I RANGER	J MADE
K HIM	L PUT	M ON	N CLOTHES	???

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

W

E

A

I

N

T

R

H

4

 $(a - d)(d + 3)$  $(u + 2)(v + 5)$  $(x + 4)(x - k)$  $(a + d)(a - 2)$  $(2y^2 + 1)(y + 1)$  $(x + k)(x + 3)$  $(a - d)(d - 2)$  $(y^2 + 2)(y + 1)$  $(x + k)(4x + 3)$  $(u + v)(v + 5)$  $(u^2 + v^2)(u - v)$  $(x^2 + 1)(5y - 1)$  $(7a + 2)(b + 7)$  $(t + 3k)(t + 2)$  $(m^2 + n^2)(m + n)$  $(3t - k)(t + 2)$  $(m^2 - 2)(m + n)$  $(2a + 1)(b + 7)$  $(2x + 5)(5y - 1)$  $(m - 3)(m + n)$ 

L

G

E

T

I

A

S

P

E

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  $x^2(x + 28)(x + 2)$

③  $(x + y)(x + 5)$

③  $(x - y)(y + 8)$

③  $3x(x + 5)(x + 2)$

③  $(x + 7)(x - d)$

③  $(x - 2y)(y + 4)$

③  $x^2(x + 8)(x - 7)$

③  $5(7x + 1)(x - 3)$

③  $(x - 7)(x^2 + d)$

③  $4x(3x + 4)(3x - 4)$

③  $5(7x - 1)(2x + 3)$

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:

③  $(2ax + 1)(x + 4)$

③  $(x + 5)(x - 5)(x^2 + 3)$

③  $2x^2(2x + 7)^2$

③  $(x^2 + y^2)(x + y)(x - y)$

③  $(x + 2)(x - 2)(x + 5)(x - 5)$

③  $2a(x - 6)(x - 5)$

③  $(2ax - 4)(x + 1)$

③  $(y^2 - 15)(x + 1)(x - 1)$

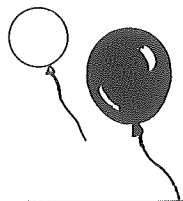
③  $(x + 5)(x + 3)(x - 3)$

③  $(y^2 - 15)(x + 5)(x - 2)$

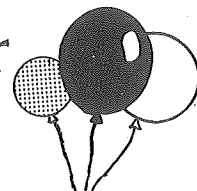
③  $2a(x + 15)(x - 2)$

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
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# 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  $3n^2 - 17n + 24$  SR

②  $4x^3y - 49xy^3$  UI

③  $5x^2 + 20xy - 60y^2$  EF

④  $3x^3 - x^2y + 12x - 4y$  LL

⑤  $2x^4y - 3x^3y - 20x^2y$  AN

⑥  $9x^3y + 33x^2y^2 + 30xy^3$  TH

⑦  $16a^3b^4 + 40a^2b^5 + 8ab^3$  TE

⑧  $t^4 - 37t^2 + 36$  YQ

⑨  $2a^7b^3 - 288ab$  AT

⑩  $35a^2b - 5a - 7ab^2 + b$  UL

⑪  $6a^4b^2 - 11a^3b^3 + 4a^2b^4$  EA

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

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

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

T	H	A	T	S	R	E	A	L	L	Y	Q	U	I	T	E	A	N	E	Y	E	F	U	L
6	9	1	11	4	8	2	7	5	12	3	10												

That's really quite an eyeful (Eiffel).