2.4 Factoring $x^2 + bx + c$ Worksheet   Name: KEY

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 S $m^2 + 8m + 7$ $(m+7)(m+1)$
② T $m^2 + 5m + 6$ $(m+2)(m+3)$
③ E $m^2 + 10m + 9$ $(m+9)(m+1)$
④ G $m^2 - 6m + 8$ $(m-4)(m-2)$
⑤ A $m^2 - 8m + 12$ $(m-6)(m-2)$
⑥ O $m^2 + 11m + 24$ $(m+3)(m+8)$

⑦ L $d^2 - 8d + 15$ $(d-5)(d-3)$
⑧ E $d^2 - 12d + 20$ $(d-10)(d-2)$
⑨ F $d^2 + 14d + 13$ $(d+13)(d+1)$
⑩ A $d^2 - 13d + 36$ $(d-9)(d-4)$
⑪ U $d^2 + 17d + 30$ $(d+15)(d+2)$
⑫ T $d^2 + 9d + 18$ $(d+6)(d+3)$

⑬ G $x^2 + 5xy + 4y^2$ $(x+4y)(x+y)$
⑭ O $x^2 - 18xy + 32y^2$ $(x-16y)(x-2y)$
⑮ N $x^2 - 13xy + 40y^2$ $(x-8y)(x-5y)$
⑯ I $x^2 + 7xy + 12y^2$ $(x+3y)(x+4y)$
⑰ T $x^2 - 27xy + 26y^2$ $(x-26y)(x-y)$
⑱ R $x^2 + 19xy + 60y^2$ $(x+4y)(x+15y)$

Answer bank (letters with factored forms):

T	L	N	A	I	G	A	N	L	T
$(x-26y)(x-y)$	$(x-2y)(x-13y)$	$(x-5y)(x-8y)$	$(x+20y)(x+3y)$	$(x+4y)(x+3y)$	$(x+y)(x+4y)$	$(x+2y)(x+4y)$	$(x+4y)(x+15y)$	$(x-16y)(x-2y)$	

O R E G I A N L T

T	A	M	O	E	L	U	N	F
$(d+6)(d+3)$	$(d-4)(d-9)$	$(d-5)(d-4)$	$(d-2)(d-18)$	$(d-10)(d-2)$	$(d-5)(d-3)$	$(d+2)(d+15)$	$(d+2)(d+9)$	$(d+1)(d+13)$

Y	O	T	U	S	A	B	E	G
$(m-2)(m-8)$	$(m+8)(m+3)$	$(m+2)(m+3)$	$(m+3)(m+4)$	$(m+7)(m+1)$	$(m-2)(m-6)$	$(m+8)(m+1)$	$(m+9)(m+1)$	$(m-2)(m-4)$

★ BUY NO MEAL → sounds like BINOMIAL ← hahahaha!

BUY   NOM   EAL

OBJECTIVE 3–I: To factor trinomials of the form $x^2 + bx + c$, where c is positive.

A THE	**B** CAT	**C** WHO	**D** JOINED
E THE	**F** RED	**G** CROSS	**H** BECAUSE
I IT	**J** WANTED	**K** TO	**L** BE
M A	**N** FIRST	**O** AID	**P** KIT ?

Answer column (right):

Factored form	Word
$(x-18)(x+1)$	WANTED (J)
$(x+9y)(x-4y)$	KIT (P)
$(x-18y)(x+2y)$	BAND
$(x-12y)(x+3y)$	AID (O)
$(x+5y)(x-3y)$	A (M)
$(x+8)(x-3)$	TO (K)
$(x+6)(x-4)$	HELP
$(x+6)(x-3)$	IT (I)
$(x-25y)(x+2y)$	LION
$(x-12)(x+2)$	BE (L)
$(x-10y)(x+5y)$	FIRST (N)

Answer column (left):

Factored form	Word
$(t+3)(t-2)$	STARTED
$(t+6)(t-1)$	WHO (C)
$(t+6)(t-2)$	RED (F)
$(t+5)(t-2)$	THE (A)
$(t-9)(t+8)$	BECAUSE (H)
$(t-4)(t+2)$	JOINED (O)
$(t-4)(t+5)$	ARMY
$(t-10)(t+2)$	CROSS (G)
$(t+7)(t-3)$	CAT (B)
$(t+4)(t-3)$	AFTER
$(t-11)(t+1)$	THE (E)

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) $t^2 + 3t - 10$ $(t+5)(t-2)$ $\frac{5 \times -2 = -10}{5 + -2 = 3}$

B) $t^2 + 4t - 21$ $(t+7)(t-3)$ $\frac{7 \times -3 = -21}{7 + -3 = 4}$

C) $t^2 + 5t - 6$ $(t+6)(t-1)$ $\frac{6 \times -1 = -6}{6 + -1 = 5}$

D) $t^2 - 2t - 8$ $(t-4)(t+2)$ $\frac{-4 \times 2 = -8}{-4 + 2 = -2}$

E) $t^2 - 10t - 11$ $(t-11)(t+1)$ $\frac{-11 \times 1 = -11}{-11 + 1 = -10}$

F) $t^2 + 4t - 12$ $(t+6)(t-2)$ $\frac{6 \times -2 = -12}{6 + -2 = 4}$

G) $t^2 - 8t - 20$ $(t-10)(t+2)$ $\frac{-10 \times 2 = -20}{-10 + 2 = -8}$

H) $t^2 - t - 72$ $(t-9)(t+8)$ $\frac{-9 \times 8 = -72}{-9 + 8 = -1}$

I) $x^2 + 3x - 18$ $(x+6)(x-3)$ $\frac{6 \times -3 = -18}{6 + -3 = 3}$

J) $x^2 - 17x - 18$ $(x-18)(x+1)$ $\frac{-18 \times 1 = -18}{-18 + 1 = -17}$

K) $x^2 + 5x - 24$ $(x+8)(x-3)$ $\frac{8 \times -3 = -24}{8 + -3 = 5}$

L) $x^2 - 10x - 24$ $(x-12)(x+2)$ $\frac{-12 \times 2 = -24}{-12 + 2 = -10}$

M) $x^2 + 2xy - 15y^2$ $(x+5y)(x-3y)$ $\frac{5 \times -3 = -15}{5 + -3 = 2}$

N) $x^2 - 5xy - 50y^2$ $(x-10y)(x+5y)$ $\frac{-10 \times 5 = -50}{-10 + 5 = -5}$

O) $x^2 - 9xy - 36y^2$ $(x-12y)(x+3y)$ $\frac{-12 \times 3 = -36}{-12 + 3 = -9}$

P) $x^2 + 5xy - 36y^2$ $(x-4y)(x+9y)$ $\frac{-4 \times 9 = -36}{-4 + 9 = 5}$

OBJECTIVE 3–m: To factor trinomials of the form $x^2 + bx + c$, where c is negative.

ALGEBRA WITH PIZZAZZ!
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KEY

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.

$\frac{1 \times 5 = 5}{1 + 5 = 6}$

W ① $n^2 + 6n + 5$
$(n+1)(n+5)$

H ② $n^2 + 7n + 10$
$(n+2)(n+5)$

E ③ $n^2 - 7n + 12$
$(n-3)(n-4)$

N ④ $n^2 - 11n + 28$
$(n-7)(n-4)$

H ⑤ $n^2 + 2n - 15$
$(n+5)(n-3)$

E ⑥ $n^2 - 5n - 24$
$(n-8)(n+3)$

S ⑦ $n^2 + n - 56$
$(n+8)(n-7)$

I ⑧ $t^2 + 10t + 16$
$(t+8)(t+2)$

T ⑨ $t^2 - 15t + 50$
$(t-10)(t-5)$

S ⑩ $t^2 + 8t - 9$
$(t+9)(t-1)$

O ⑪ $t^2 - 7t - 30$
$(t-10)(t+3)$

N ⑫ $t^2 - t - 30$
$(t-6)(t+5)$

T ⑬ $t^2 + 14t + 48$
$(t+6)(t+8)$

H ⑭ $t^2 + 8t - 48$
$(t+12)(t-4)$

E ⑮ $a^2 + 5ab + 6b^2$
$(a+2b)(a+3b)$

T ⑯ $a^2 - 4ab - 21b^2$
$(a-7b)(a+3b)$

H ⑰ $a^2 + 6ab - 7b^2$
$(a+7b)(a-b)$

R ⑱ $a^2 - 14ab - 32b^2$
$(a-16b)(a+2b)$

O ⑲ $a^2 - 29ab + 100b^2$
$(a-25b)(a-4b)$

W ⑳ $a^2 + 7ab - 18b^2$
$(a+9b)(a-2b)$

N ㉑ $a^2 + 2ab + b^2$
$(a+b)(a+b)$
$\frac{1 \times 1 = 1}{1 + 1 = 2}$

Answers:

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

Answers:

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

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
W	H	E	N	H	E	S	I	T	S	O	N	T	H	E	T	H	R	O	W	N

woo !
hoo.

OBJECTIVE 3–n: To factor trinomials of the form $x^2 + bx + c$, where c is positive or negative (review).