

Practice

Factoring – Trinomials w/Leading Coefficient 1

Answer these problems, then check your answers using the key on the next page. If you missed something, look at the solutions after the answer key, and if you still don't understand, watch the review video again.

#1) Factor this expression completely: $x^2 + 5x - 24$

#2) Express $x^2 + 5x - 6$ as a product of two binomials.

#3) Factor this expression completely: $a^2 - 5a + 6$

#4) Factor this expression completely: $x^2 + 6x + 8$

#5) If you factor $x^2 + x - 2$ you get $(x-1)(x+2)$ as the answer. Is it okay to write this answer in the form $(x+2)(x-1)$? Why, or why not?

#6) Factor this expression completely: $w^2 - 6w - 7$

#7) Factor this expression completely: $x^2 - 4x + 4$

#8) Factor this expression completely: $m^2 + 6m + 9$

#9) Factor this expression completely: $x^2 - 3xy - 4y^2$

#10) Factor this expression completely: $r^2 - 2rs + s^2$

Answers:

#1) $(x-3)(x+8)$

#2) $(x-1)(x+6)$

#3) $(a-2)(a-3)$

#4) $(x+2)(x+4)$

#5) Yes. The Commutative Property of Multiplication states that $A*B = B*A$,
so $(x-1)(x+2)$ and $(x+2)(x-1)$ are equivalent.

#6) $(w+1)(w-7)$

#7) $(x-2)(x-2)$ or $(x-2)^2$

#8) $(m+3)(m+3)$ or $(m+3)^2$

#9) $(x+y)(x-4y)$

#10) $(r-s)(r-s)$ or $(r-s)^2$

Solutions:

#1) Factor this expression completely: $x^2 + 5x - 24$

$$\boxed{(x-3)(x+8)}$$

mult	add
-24	5
1. -24	-23
-1. 24	23
2. -12	-10
-2. 12	10
3. -8	-5
(-3) (8)	5 ←
4. -6	-2
-4. 6	2

check:

$$(x-3)(x+8)$$

$$x^2 + 8x - 3x - 24$$

$$x^2 + 5x - 24 \checkmark$$

#2) Express $x^2 + 5x - 6$ as a product of two binomials.

$$\boxed{(x-1)(x+6)}$$

mult	add
-6	5
1. -6	-5
(-1) (6)	5 ←
2. -3	-1
-2. 3	1

check:

$$(x-1)(x+6)$$

$$x^2 + 6x - x - 6$$

$$x^2 + 5x - 6 \checkmark$$

#3) Factor this expression completely: $a^2 - 5a + 6$

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

mult	add
6	-5
1. 6	7
-1. -6	-7
2. 3	5
(-2) (-3)	-5 ←

check:

$$(a-2)(a-3)$$

$$a^2 - 3a - 2a + 6$$

$$a^2 - 5a + 6 \checkmark$$

#4) Factor this expression completely: $x^2 + 6x + 8$

$$\boxed{(x+2)(x+4)}$$

mult	add
8	6
1. 8	9
-1. -8	-9
(2) (4)	6 ←
-2. -4	-6

check:

$$(x+2)(x+4)$$

$$x^2 + 4x + 2x + 8$$

$$x^2 + 6x + 8 \checkmark$$

#5) If you factor $x^2 + x - 2$ you get $(x-1)(x+2)$ as the answer. Is it okay to write this answer in the form $(x+2)(x-1)$? Why, or why not?

Yes. Commutative Property of Multiplication:

$$3 \cdot 2 = 6$$

$$2 \cdot 3 = 6$$

works also for factors with variables:

both are correct ways to write the answer

$$(x-1)(x+2) = x^2 + x - 2$$

$$(x+2)(x-1) = x^2 + x - 2$$

#6) Factor this expression completely: $w^2 - 6w - 7$

$$\boxed{(w+1)(w-7)}$$

mult	add
-7	-6
1, -7	-6 ←
-1, 7	6

check:

$$(w+1)(w-7)$$

$$w^2 - 7w + w - 7$$

$$w^2 - 6w - 7 ✓$$

#7) Factor this expression completely: $x^2 - 4x + 4$

$$\boxed{(x-2)(x-2)}$$

or

$$\boxed{(x-2)^2}$$

mult	add
4	-4
1, 4	5
-1, 4	3
2, 2	4
-2, -2	-4 ←

check:

$$(x-2)(x-2)$$

$$x^2 - 2x - 2x + 4$$

$$x^2 - 4x + 4 ✓$$

#8) Factor this expression completely: $m^2 + 6m + 9$

$$\boxed{(m+3)(m+3)}$$

or

$$\boxed{(m+3)^2}$$

mult	add
9	6
1, 9	10
-1, -9	-10
3, 3	6 ←
-3, -3	-6

check:

$$(m+3)(m+3)$$

$$m^2 + 3m + 3m + 9$$

$$m^2 + 6m + 9 ✓$$

#9) Factor this expression completely: $x^2 - 3xy - 4y^2$

ignore y at first:

$$x^2 - 3x - 4$$

add the y:

$$\boxed{(x+y)(x-4y)}$$

mult	add
-4	-3
1, -4	-3 ←
-1, 4	3
2, -2	0

check:

$$(x+y)(x-4y)$$

$$x^2 - 4xy + xy - 4y^2$$

$$x^2 - 3xy - 4y^2 ✓$$

#10) Factor this expression completely: $r^2 - 2rs + s^2$

ignore s at first:

$$r^2 - 2r + 1$$

add the s:

$$\boxed{(r-s)(r-s)}$$

or

$$\boxed{(r-s)^2}$$

mult	add
1	-2
1, 1	2
-1, -1	-2 ←

check:

$$(r-s)(r-s)$$

$$r^2 - rs - rs + s^2$$

$$r^2 - 2rs + s^2 ✓$$