

# 9.2 Factor Trinomials

# PRACTICE

**Check the work! Multiply out the factored form to see if it matches the polynomial.**

1. Is  $(x+6)(x-5)$  the factored form of  $x^2 - 3x - 30$ ?

$$x^2 - 5x + 6x - 30$$

$$\boxed{x^2 + 1x - 30}$$

NO

2. Is  $(x+4)(x-7)$  the factored form of  $x^2 - 3x - 28$ ?

$$x^2 - 7x + 4x - 28$$

$$\boxed{x^2 - 3x - 28}$$

YES

3. Is  $(x-4)(x+3)$  the factored form of  $x^2 - x - 12$ ?

$$x^2 + 3x - 4x - 12$$

$$\boxed{x^2 - 1x - 12}$$

YES

4. Is  $m(m-3)$  the factored form of  $m^2 - 3$ ?

$$\boxed{m^2 - 3m}$$

NO

5. Is  $(d-7)(d-5)$  the factored form of  $d^2 - 12d - 35$ ?

$$d^2 - 5d - 7d + 35$$

$$\boxed{d^2 - 12d + 35}$$

NO

6. Is  $(t+3)(t-3)$  the factored form of  $t^2 - 9$ ?

$$t^2 - 3t + 3t - 9$$

$$\boxed{t^2 - 9}$$

YES

**Factor the following if possible. Check your answer by multiplying!**

7.  $x^2 - 2x - 48$

$$\boxed{(x-8)(x+6)}$$

~~$\begin{matrix} -2 \\ -8 \times 6 \\ -48 \end{matrix}$~~

CHECK:  $(x-8)(x+6)$

$$x^2 + 6x - 8x - 48$$

$$x^2 - 2x - 48 \checkmark$$

8.  $x^2 + 14x + 24$

$$\boxed{(x+12)(x+2)}$$

~~$\begin{matrix} 14 \\ 12 \times 2 \\ 24 \end{matrix}$~~

CHECK:  $(x+12)(x+2)$

$$x^2 + 2x + 12x + 24$$

$$x^2 + 14x + 24 \checkmark$$

9.  $m^2 - 10m + 16$

$$\boxed{(m-2)(m-8)}$$

~~$\begin{matrix} -10 \\ -2 \times -8 \\ 16 \end{matrix}$~~

CHECK:  $(m-2)(m-8)$

$$m^2 - 8m - 2m + 16$$

$$m^2 - 10m + 16 \checkmark$$

10.  $p^2 - 4p - 5$

$$\boxed{(p-5)(p+1)}$$

~~$\begin{matrix} -4 \\ -5 \times 1 \end{matrix}$~~

CHECK:  $(p-5)(p+1)$

$$p^2 + p - 5p - 5$$

$$p^2 - 4p - 5 \checkmark$$

11.  $x^2 - 64$

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

Difference of Squares!

CHECK:  $(x+8)(x-8)$

$$x^2 - 8x + 8x - 64$$

$$x^2 - 64 \checkmark$$

12.  $h^2 + 3h - 54$

$$\boxed{(h+9)(h-6)}$$

~~$\begin{matrix} 3 \\ 9 \times -6 \\ -54 \end{matrix}$~~

CHECK:  $(h+9)(h-6)$

$$h^2 - 6h + 9h - 54$$

$$h^2 + 3h - 54 \checkmark$$

13.  $x^2 - 8x$

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

Greatest Common Factor!

CHECK:  $x(x-8)$

$$x^2 - 8x \checkmark$$

14.  $x^2 + 2x + 12$

NOT POSSIBLE!

CHECK:

15.  $t^2 - 49$

$$\boxed{(t+7)(t-7)}$$

Difference of Squares!

CHECK:  $(t+7)(t-7)$

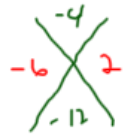
$$t^2 - 7t + 7t - 49$$

$$t^2 - 49$$

Solve the following by factoring.

16.  $x^2 - 4x - 12 = 0$

$(x-6)(x+2) = 0$   
 $x-6=0$  |  $x+2=0$   
 $\underline{+6}$   $\underline{+6}$  |  $\underline{-2}$   $\underline{-2}$   
 $x=6$  |  $x=-2$



$x = -2, 6$

17.  $0 = x^2 + 3x - 40$

$0 = (x+8)(x-5)$   
 $x+8=0$  |  $x-5=0$   
 $\underline{-8}$   $\underline{-8}$  |  $\underline{+5}$   $\underline{+5}$   
 $x=-8$  |  $x=5$



$x = -8, 5$

18.  $2a^2 - 8a = 0$

$2a(a-4) = 0$   
 $\frac{2a}{2} = 0$  |  $a-4=0$   
 $\underline{+4}$   $\underline{+4}$   
 $a=0$  |  $a=4$

Greatest Common Factor!

$a = 0, 4$

19.  $x^2 + 2x + 1 = 0$

$(x+1)(x+1) = 0$   
 $x+1=0$  |  $x+1=0$   
 $\underline{-1}$   $\underline{-1}$  |  $\underline{-1}$   $\underline{-1}$   
 $x=-1$  |  $x=-1$



$x = -1$

Solve the following by factoring.

20.  $g^2 - 16 = 0$

$(g+4)(g-4) = 0$   
 $g+4=0$  |  $g-4=0$   
 $\underline{-4}$   $\underline{-4}$  |  $\underline{+4}$   $\underline{+4}$   
 $g=-4$  |  $g=4$

Difference of Squares!

$g = -4, 4$

21.  $y^2 + 4y = 21$

$y^2 + 4y - 21 = 0$   
 $(y+7)(y-3) = 0$   
 $y+7=0$  |  $y-3=0$   
 $\underline{-7}$   $\underline{-7}$  |  $\underline{+3}$   $\underline{+3}$   
 $y=-7$  |  $y=3$



$y = -7, 3$

22.  $x^2 = 9x - 18$

$x^2 - 9x + 18 = 0$   
 $(x-3)(x-6) = 0$   
 $x-3=0$  |  $x-6=0$   
 $\underline{+3}$   $\underline{+3}$  |  $\underline{+6}$   $\underline{+6}$   
 $x=3$  |  $x=6$



$x = 3, 6$

23.  $42 = c^2 + c - 42$

$0 = c^2 + c - 42$   
 $0 = (c+7)(c-6)$   
 $c+7=0$  |  $c-6=0$   
 $\underline{-7}$   $\underline{-7}$  |  $\underline{+6}$   $\underline{+6}$   
 $c=-7$  |  $c=6$



$c = -7, 6$

$$24. \quad x^2 + 12x + 20 = 3x$$

$$\quad \quad \quad \underline{-3x} \quad \quad \quad \underline{-3x}$$

$$x^2 + 9x + 20 = 0$$

$$(x+4)(x+5) = 0$$

$$x+4=0 \quad | \quad x+5=0$$

$$\quad \underline{-4} \quad \underline{-4} \quad | \quad \underline{-5} \quad \underline{-5}$$

$$x = -4 \quad \quad x = -5$$

$$\begin{array}{c} 9 \\ 4 \quad \times \quad 5 \\ 20 \end{array}$$

$$x = -5, -4$$

$$25. \quad 0 = 2 + h^2 + 3h$$

$$0 = h^2 + 3h + 2$$

$$0 = (h+2)(h+1)$$

$$h+2=0 \quad | \quad h+1=0$$

$$\quad \underline{-2} \quad \underline{-2} \quad | \quad \underline{-1} \quad \underline{-1}$$

$$h = -2 \quad \quad h = -1$$

$$\begin{array}{c} 3 \\ 2 \quad \times \quad 1 \\ 2 \end{array}$$

$$h = -2, -1$$

Answer the following.

$$26. \text{ Simplify}$$

$$(3x^2 - 2x + 1) - (3x^2 - x + 5)$$

$$\cancel{3x^2} - 2x + 1 - \cancel{3x^2} + x - 5$$

$$-x - 4$$

$$27. \text{ Multiply } (x+5)^2$$

$$(x+5)(x+5)$$

$$x^2 + 5x + 5x + 25$$

$$x^2 + 10x + 25$$

$$28. \text{ Solve } \frac{2}{x} + 5 = 7$$

$$\quad \quad \quad \underline{-5} \quad \quad \quad \underline{-5}$$

$$x \cdot \frac{2}{x} = 2 \cdot x$$

$$\frac{2}{2} = \frac{2x}{2}$$

$$1 = x$$

$$29. \text{ Write the equation of the linear function for the situation below.}$$

Bob has 47 dollars and spends 3 dollars every 2 weeks.

$$m(t) = 47 - \frac{3}{2}t$$

$$30. \text{ Write the equation of the exponential function for the situation.}$$

Bob has 47 dollars and doubles his money every 3 weeks.

$$m(t) = 47(2)^{t/3}$$

$$31. \text{ If } f(x) = x^2 - x, \text{ find } 2f(3) + 1$$

$$f(3) = 3^2 - 3$$

$$f(3) = 6$$

$$2 \cdot 6 + 1$$

$$12 + 1$$

$$13$$