

# 4-3 Practice

Write a quadratic equation in standard form with the given root(s).

1. 7, 2

$$(x-7)(x-2) = 0$$

$$x^2 - 2x - 7x + 14$$

$$x^2 - 9x + 14 = 0$$

2. -5, 8

$$(x+5)(x-8) = 0$$

$$x^2 - 8x + 5x - 40 = 0$$

$$x^2 - 3x - 40 = 0$$

3. -6, -3

$$(x+6)(x+3) = 0$$

$$x^2 + 3x + 6x + 18 = 0$$

$$x^2 + 9x + 18 = 0$$

4. 3, -4

$$(x-3)(x+4) = 0$$

$$x^2 + 4x - 3x - 12 = 0$$

$$x^2 + x - 12 = 0$$

Solve each equation by factoring.

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

$$(x-6)(x+2) = 0$$

-12
2   6
3   -4

$$+ = -4$$

$$x-6=0$$

$$+0+6$$

$$x+2=0$$

$$-2-2$$

$$x=6$$

or

$$x=-2$$

6.  $x^2 - 16x + 64 = 0$

$$(x-8)(x-8) = 0$$

not perfect square trinomial!

$$x-8=0$$

$$+8+8$$

$$x=8$$

$$x-8=0$$

$$+8+8$$

$$x=8$$

64
-2   32
-4   16
-8   8

Can be written as  $(x-8)^2$

7.  $x^2 - 6x + 8 = 0$

$$(x-2)(x-4) = 0$$

$$x-2=0$$

$$+2+2$$

$$x-4=0$$

$$+4+4$$

$$x=2$$

$$x=4$$

8
1   8
2   4

$$+ = -6$$

8.  $x^2 - 4x = 0$

$$x(x-4) = 0$$

$$x=0$$

or  $x-4=0$

$$+4+4$$

$$x=4$$

9.  $x^2 = 2x + 99$

10.  $x^2 + 12x = -36$

$$x^2 - 2x - 99 = 0$$

$$(x + 9)(x - 11) = 0$$

$$\begin{array}{r} x + 9 = 0 \\ -9 \quad -9 \\ \hline x = -9 \end{array}$$

$$\begin{array}{r} x - 11 = 0 \\ +11 \quad +11 \\ \hline x = 11 \end{array}$$

$$\begin{array}{r} 99 \\ 1 \overline{) 99} \\ 9 \overline{) 11} \end{array}$$

$$x^2 + 12x + 36 = 0$$

perfect square trinomial  
 $\sqrt{36} = 6 \cdot 2 = 12$

$$(x + 6)(x + 6) = 0$$

$$x + 6 = 0$$

$$\begin{array}{r} -6 \quad -6 \\ \hline x = -6 \end{array}$$

or  $(x + 6)^2 = 0$

11.  $5x^2 - 35x + 60 = 0$

12.  $36x^2 = 25$

factor GCF!

$$5(x^2 - 7x + 12) = 0$$

$$5(x - 3)(x - 4) = 0$$

$$\begin{array}{r} x - 3 = 0 \\ +3 \quad +3 \\ \hline x = 3 \end{array}$$

or

$$\begin{array}{r} x - 4 = 0 \\ +4 \quad +4 \\ \hline x = 4 \end{array}$$

Diff. of squares

$$36x^2 - 25 = 0$$

$$\sqrt{36} = 6 \quad \sqrt{25} = 5$$

$$(6x + 5)(6x - 5) = 0$$

$$6x + 5 = 0$$

$$\begin{array}{r} 6x = -5 \\ \hline x = -5/6 \end{array}$$

$$6x - 5 = 0$$

$$\begin{array}{r} 6x = 5 \\ \hline x = 5/6 \end{array}$$

13.  $x^2 + 12x + 36 = 0$

14.  $2x^2 + 11x + 12 = 0$

perfect square trinomial

$$\sqrt{1} = 1$$

$$\sqrt{36} = 6$$

$$2 \cdot 6 = 12$$

$$(x + 6)^2 = 0$$

$$x + 6 = 0$$

$$\begin{array}{r} -6 \quad -6 \\ \hline x = -6 \end{array}$$

Lead coeff. 2

step 1:  $2 \cdot 12 = 24$  step 2:  $\frac{24}{2} = 12$

$$\begin{array}{r} 2 \overline{) 24} \\ 4 \overline{) 12} \\ 3 \overline{) 8} \\ 4 \overline{) 6} \end{array}$$

step 3:  $2x^2 + 8x + 3x + 12 = 0$

step 4:  $2x(x + 4) + 3(x + 4) = 0$

step 5:  $(2x + 3)(x + 4) = 0$

step 6:  $2x + 3 = 0$  or  $x + 4 = 0$

$$\begin{array}{r} 2x + 3 = 0 \\ -3 \quad -3 \\ \hline 2x = -3 \\ \hline x = -3/2 \end{array}$$

$$\begin{array}{r} x + 4 = 0 \\ -4 \quad -4 \\ \hline x = -4 \end{array}$$

15.  $3x^2 - 2x - 8 = 0$

16.  $x^2 - 10x + 25 = 0$

Lead coeff. 3

step 1:  $3 \cdot -8 = -24$

$$\begin{array}{r} 3 \overline{) 24} \\ 4 \overline{) 8} \\ 2 \overline{) 12} \end{array}$$

step 2:  $3x^2 - 6x + 4x - 8 = 0$

step 3:  $3x(x - 2) + 4(x - 2) = 0$

step 4:  $(3x + 4)(x - 2) = 0$

steps:  $3x + 4 = 0$  or  $x - 2 = 0$

$$\begin{array}{r} 3x + 4 = 0 \\ -4 \quad -4 \\ \hline 3x = -4 \\ \hline x = -4/3 \end{array}$$

$$\begin{array}{r} x - 2 = 0 \\ +2 \quad +2 \\ \hline x = 2 \end{array}$$

perfect square

$$\sqrt{1} = 1$$

$$\sqrt{25} = 5$$

$$1 \cdot 5 = 5 \cdot 2 = 10$$

$$(x - 5)(x - 5) = 0$$

or  $(x - 5)^2 = 0$

$$x - 5 = 0$$

$$\begin{array}{r} -5 \quad -5 \\ \hline x = 5 \end{array}$$