

Practice Problems

1. Solve each of the following equations for all value(s) of x .

(a) $(x-2)(x+5)=0$

(b) $(7x-1)(2x+5)=0$

(c) $(3x-1)(3x+1)=0$

$$\begin{array}{l} x-2=0 \text{ or } x+5=0 \\ x=2 \text{ or } x=-5 \\ \{-5, 2\} \end{array}$$

$$\begin{array}{l} 7x-1=0 \text{ or } 2x+5=0 \\ x=\frac{1}{7} \text{ or } x=-\frac{5}{2} \\ \{-\frac{5}{2}, \frac{1}{7}\} \end{array}$$

$$\begin{array}{l} 3x-1=0 \text{ or } 3x+1=0 \\ x=\frac{1}{3} \text{ or } x=-\frac{1}{3} \\ \{\pm\frac{1}{3}\} \end{array}$$

2. Solve each of the following quadratic equations which have already been set equal to zero.

(a) $x^2+10x+16=0$

(b) $3x^2+11x-4=0$

(c) $12x^2+8x=0$

$$\begin{array}{l} (x+2)(x+8)=0 \\ x+2=0 \text{ or } x+8=0 \\ x=-2 \text{ or } x=-8 \\ \{-8, -2\} \end{array}$$

$$\begin{array}{l} (3x-1)(x+4)=0 \\ 3x-1=0 \text{ or } x+4=0 \\ x=\frac{1}{3} \text{ or } x=-4 \\ \{-4, \frac{1}{3}\} \end{array}$$

$$\begin{array}{l} 4x(3x+2)=0 \\ 4x=0 \text{ or } 3x+2=0 \\ x=0 \text{ or } x=-\frac{2}{3} \\ \{-\frac{2}{3}, 0\} \end{array}$$

3. Solve each of the following quadratic equations by first manipulating them so that one side of the equation is set equal to zero.

(a) $x^2+4x-40=10x+15$

(b) $4x^2+3x-11=3x-2$

$$\begin{array}{l} x^2+4x-40=10x+15 \\ -10x-15=-10x-15 \\ x^2-6x-55=0 \\ (x+5)(x-11)=0 \\ x+5=0 \text{ or } x-11=0 \\ x=-5 \text{ or } x=11 \\ \{-5, 11\} \end{array}$$

$$\begin{array}{l} 4x^2+3x-11=3x-2 \\ -3x+2=-3x+2 \\ 4x^2-9=0 \\ (2x+3)(2x-3)=0 \\ 2x+3=0 \text{ or } 2x-3=0 \\ x=-\frac{3}{2} \text{ or } x=\frac{3}{2} \\ \{\pm\frac{3}{2}\} \end{array}$$

(c) $6x^2-15x+2=2x^2+10x-4$

(d) $-16t^2+76t+5=12t+5$

$$\begin{array}{l} 6x^2-15x+2=2x^2+10x-4 \\ -2x^2-10x+4=-2x^2-10x+4 \\ 4x^2-25x+6=0 \\ (4x-1)(x-6)=0 \\ 4x-1=0 \text{ or } x-6=0 \\ x=\frac{1}{4} \text{ or } x=6 \\ \{\frac{1}{4}, 6\} \end{array}$$

$$\begin{array}{l} -16t^2+76t+5=12t+5 \\ -12t-5=-12t-5 \\ -16t^2+64t=0 \\ -16t(t-4)=0 \\ -16t=0 \text{ or } t-4=0 \\ t=0 \text{ or } t=4 \\ \{0, 4\} \end{array}$$

Directions: Solve each equation by factoring or by using the zero product property.

1. $(x+2)(x+7)=0$

$$\begin{array}{r} x+2=0 \\ \hline -2-2 \\ \hline x=-2 \end{array} \quad \begin{array}{r} x+7=0 \\ \hline -7-7 \\ \hline x=-7 \end{array}$$

$\{-7, -2\}$

2. $(x-11)(x+5)=0$

$$\begin{array}{r} x-11=0 \\ \hline +11+11 \\ \hline x=11 \end{array} \quad \begin{array}{r} x+5=0 \\ \hline -5-5 \\ \hline x=-5 \end{array}$$

$\{-5, 11\}$

3. $(x-10)^2=0$

$$(x-10)(x-10)=0$$

Since there are the same, there is only be ONE answer

$$\begin{array}{r} x-10=0 \\ \hline +10+10 \\ \hline x=10 \end{array} \quad \{10\}$$

4. $x^2+12x+35=0$

$a=1$
 $b=12$
 $c=35$

$$\begin{array}{r} a/c \\ 35 \\ \hline 7 \quad 5 \\ \hline 12 \end{array}$$

$$(x+7)(x+5)=0$$

$$\begin{array}{l} x+7=0 \\ x=-7 \end{array} \quad \begin{array}{l} x+5=0 \\ x=-5 \end{array}$$

$\{-7, -5\}$

5. $x^2+2x-63=0$

$a=1$
 $b=2$
 $c=-63$

$$\begin{array}{r} -63 \\ \hline 9 \quad -7 \\ \hline 2 \end{array}$$

$$(x+9)(x-7)=0$$

$$\begin{array}{l} x+9=0 \\ x=-9 \end{array} \quad \begin{array}{l} x-7=0 \\ x=7 \end{array}$$

$\{7, -9\}$

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

$a=1$
 $b=-10$
 $c=16$

$$\begin{array}{r} 16 \\ \hline -8 \quad -2 \\ \hline -10 \end{array}$$

$$(x-8)(x-2)=0$$

$$\begin{array}{l} x-8=0 \\ x=8 \end{array} \quad \begin{array}{l} x-2=0 \\ x=2 \end{array}$$

$\{2, 8\}$

7. $2x^2-16x+32=0$

$a=2$
 $b=-16$
 $c=32$

$$\begin{array}{r} 64 \\ \hline -8 \quad -8 \\ \hline -16 \end{array}$$

$$2x^2-8x-8x+32=0$$

$$2x(x-4)-8(x-4)=0$$

$$(x-4)(2x-8)=0$$

$$\begin{array}{l} x-4=0 \\ x=4 \end{array} \quad \begin{array}{l} 2x-8=0 \\ 2x=8 \\ x=4 \end{array}$$

$\{4\}$

8. $x^2+16x+48=0$

$a=1$
 $b=16$
 $c=48$

$$\begin{array}{r} 48 \\ \hline 12 \quad 4 \\ \hline 16 \end{array}$$

$$(x+12)(x+4)=0$$

$$\begin{array}{l} x+12=0 \\ x=-12 \end{array} \quad \begin{array}{l} x+4=0 \\ x=-4 \end{array}$$

$\{-12, -4\}$