

Solve each equation by graphing the related function. If the equation has no real-number solutions, write *no real solutions*. Round answers to nearest hundredth if necessary.

1.) $x^2 - 16 = 0$
 $\quad \quad \quad +16 \quad +16$

$$\sqrt{x^2} = \sqrt{16}$$

$$x = \pm 4$$

2.) $2x^2 + 12 = 0$
 $\quad \quad \quad -12 \quad -12$

$$\frac{2x^2}{2} = \frac{-12}{2}$$

$$\sqrt{x^2} = \sqrt{-6}$$

No real solutions

3.) $4x^2 - 36 = 0$
 $\quad \quad \quad +36 \quad +36$

$$\frac{4x^2}{4} = \frac{36}{4}$$

$$\sqrt{x^2} = \sqrt{9}$$

$$x = \pm 3$$

Solve each equation by finding the square roots. Same rules as previous Problems.

4.) $x^2 - 256 = 0$
 $\quad \quad \quad +256 \quad +256$

$$\sqrt{x^2} = \sqrt{256}$$

$$x = \pm 16$$

5.) $x^2 - 14 = -50$
 $\quad \quad \quad +14 \quad +14$

$$\sqrt{x^2} = \sqrt{-36}$$

No real solution

6.) $100x^2 + 36 = 100$
 $\quad \quad \quad -36 \quad -36$

$$\frac{100x^2}{100} = \frac{64}{100}$$

$$\sqrt{x^2} = \sqrt{\frac{64}{100}}$$

$$x = \pm \frac{8}{10} = \pm \frac{4}{5}$$

7.) $11x^2 - 0.75 = 3.21$
 $\quad \quad \quad +0.75 \quad +0.75$

$$\frac{11x^2}{11} = \frac{3.96}{11}$$

$$\sqrt{x^2} = \sqrt{0.36}$$

$$x = \pm 0.6$$

8.) $\frac{1}{3}x^2 - 12 = 0$
 $\quad \quad \quad +12 \quad +12$

$$\frac{\frac{1}{3}x^2}{\frac{1}{3}} = \frac{12}{\frac{1}{3}}$$

$$\sqrt{x^2} = \sqrt{36}$$

$$x = \pm 6$$

9.) Find the radius of a circle with an area of 100 in^2 . Round answer to nearest tenth.

$$A = \pi r^2$$

$$\frac{100}{\pi} = \frac{\pi r^2}{\pi}$$

$$\frac{100}{\pi} = r^2 \rightarrow r = 5.6 \text{ in}$$

Solve each equation by factoring:

10.) $(4h - 3)(2h + 1) = 0$

$$\begin{array}{l} 4h - 3 = 0 \\ +3 \quad +3 \\ \hline 4h = 3 \\ \frac{4h}{4} = \frac{3}{4} \\ h = 0.75 \end{array} \quad \begin{array}{l} 2h + 1 = 0 \\ -1 \quad -1 \\ \hline 2h = -1 \\ \frac{2h}{2} = \frac{-1}{2} \\ h = -0.5 \end{array}$$

11.) $x(3x + 4) = 0$

$$\begin{array}{l} x = 0 \\ 3x + 4 = 0 \\ -4 \quad -4 \\ \hline 3x = -4 \\ \frac{3x}{3} = \frac{-4}{3} \\ x = -1.33 \end{array}$$

12.) $x^2 - x = 20$

$$\begin{array}{l} x^2 - x - 20 = 0 \\ -20 \quad -20 \\ \hline (x-5)(x+4) = 0 \\ x-5 = 0 \quad x+4 = 0 \\ +5 \quad +5 \quad -4 \quad -4 \end{array}$$

$$13.) 5p^2 + 29p - 6 = 0$$

$$(5p-1)(p+6) = 0$$

$$\begin{array}{l} 5p-1=0 \quad p+6=0 \\ +1 \quad +1 \quad -6 \quad -6 \end{array}$$

$$\frac{5p}{5} = \frac{1}{5} \quad p = -6$$

$$16.) x^2 - 7x + 6 = 0$$

$$(x-6)(x-1) = 0$$

$$\begin{array}{l} x-6=0 \quad x-1=0 \\ +6 \quad +6 \quad +1 \quad +1 \end{array}$$

$$x = 6 \quad x = 1$$

$$14.) 6x^2 + 13x = 5$$

$$\frac{6x^2 + 13x - 5 = 0}{-5 \quad -5}$$

$$(3x-1)(2x+5) = 0$$

$$\begin{array}{l} 3x-1=0 \quad 2x+5=0 \\ +1 \quad +1 \quad -5 \quad -5 \\ \frac{3x}{3} = \frac{1}{3} \quad \frac{2x}{2} = -\frac{5}{2} \\ x = \frac{1}{3} \quad x = -\frac{5}{2} \end{array}$$

$$17.) 2x^2 - 9x = 5$$

$$\frac{2x^2 - 9x - 5 = 0}{-5 \quad -5}$$

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

$$\begin{array}{l} 2x+1=0 \quad x-5=0 \\ +1 \quad +1 \quad +5 \quad +5 \\ \frac{2x}{2} = -\frac{1}{2} \quad x = 5 \\ x = -\frac{1}{2} \quad x = 5 \end{array}$$

$$15.) 3x^2 - 13x = -12$$

$$\frac{3x^2 - 13x + 12 = 0}{+12 \quad +12}$$

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

$$\begin{array}{l} 3x-4=0 \quad x-3=0 \\ +4 \quad +4 \quad +3 \quad +3 \end{array}$$

$$\frac{3x}{3} = \frac{4}{3} \quad x = 3$$

$$x = \frac{4}{3}$$

Find the value of "c" such that each expression is a perfect-square trinomial.

$$18.) x^2 - 10x + c \quad c = \frac{25}{1}$$

$$c = \left(\frac{b}{2}\right)^2 = \left(\frac{-10}{2}\right)^2$$

$$19.) x^2 + 3x + c \quad c = 2.25 = \frac{9}{4}$$

$$c = \left(\frac{b}{2}\right)^2 = \left(\frac{3}{2}\right)^2$$

Solve each by completing the square method ONLY! Show Steps!! Round to nearest hundredth.

$$20.) x^2 - 20x + 75 = 0$$

$$\frac{x^2 - 20x + 100 = -75 + 100}{-75 \quad -75}$$

$$\sqrt{(x-10)^2} = \sqrt{25}$$

$$\begin{array}{l} x-10 = \pm 5 \\ +10 \quad +10 \\ x = 10 \pm 5 = 5, 15 \end{array}$$

$$21.) x^2 - 5x - 10 = 0$$

$$\frac{x^2 - 5x + 6.25 = 10 + 6.25}{+10 \quad +10}$$

$$\sqrt{(x-2.5)^2} = \sqrt{16.25}$$

$$\begin{array}{l} x-2.5 = \pm 4.031129 \\ +2.5 \quad +2.5 \\ x = 2.5 \pm 4.03 = 6.53, -1.53 \end{array}$$

$$22.) 3x^2 + 9x + 5 = 0$$

$$\frac{x^2 + 3x + \frac{5}{3} = 0}{-5/3 \quad -5/3}$$

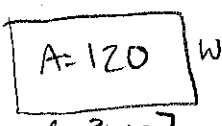
$$\frac{x^2 + 3x + 2.25 = -5/3 + 2.25}{-5/3 \quad -5/3}$$

$$\sqrt{(x+1.5)^2} = \sqrt{7/12}$$

$$\begin{array}{l} x+1.5 = \pm 0.7638 \\ -1.5 \quad -1.5 \\ x = -1.5 \pm 0.76 = -0.74, -2.26 \end{array}$$

23)

You are planning a rectangular patio with the length that is 7 ft. less than 3 times its width. The area of the patio is 120 ft². What are the dimensions of the patio?



$$w(3w-7) = 120$$

$$3w^2 - 7w = 120$$

$$\frac{w^2 - \frac{7}{3}w + \frac{49}{36} = 40 + \frac{49}{36}}{+49/36}$$

$$\sqrt{\left(w - \frac{7}{6}\right)^2} = \sqrt{41.361}$$

$$w - \frac{7}{6} = \pm 6.43$$

$$w = 7.64$$