

8.5 Solving Quadratic Equations.

Solve each equation by graphing the related function. If the equation has no real-number solution, write no solution.

1) $x^2 - 16 = x$

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

$$x+4=0 \quad x-4=0$$

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

$$\boxed{\pm 4}$$

2) $x^2 + 12 = 0$

No solution

3) $2x^2 - 18 = 0$

$$2(x^2 - 9) = 0$$

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

$$x+3=0 \quad x-3=0$$

$$x=-3 \quad x=3$$

$$\boxed{\pm 3}$$

4) $\frac{7x^2}{7} = \frac{0}{7}$

$$\sqrt{x^2} = \sqrt{0}$$

$$\boxed{x=0}$$

5) $\frac{1}{2}x^2 - 2 = 0$

$$\boxed{x = \pm 2}$$

6) $x^2 + 49 = 0$

No solution.

$$\begin{array}{r} x^2 + 49 = 0 \\ -49 \quad -49 \\ \hline \end{array}$$

$$\sqrt{x^2} = \sqrt{-49}$$

$x =$ No solution.

7) Find the x-intercept

$$f(x) = 4x^2 - 36$$

$$\boxed{x = \pm 3}$$

$$4x^2 - 36 = 0$$

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

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

$$\boxed{\pm 3}$$

$$9) f(x) = x^2 + 36$$

10)

$$x^2 + 36 = 0$$

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

$$x = \text{No solution}$$

Solve each equation by finding square roots.

$$10) t^2 = 25$$

$$\sqrt{t^2} = \sqrt{25}$$

$$t = \pm 5$$

$$11) k^2 = 484$$

$$\sqrt{k^2} = \sqrt{484}$$

$$k = \pm 22$$

$$12) z^2 - 256 = 0$$

$$+ 256 \quad + 256$$

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

$$z = \pm 16$$

$$13) d^2 - 14 = -50$$

$$d^2 - 14 = -50$$

$$+14 \quad +14$$

$$d^2 = -36$$

No solution

$$14) 9y^2 - 16 = 0$$

$$9y^2 = 16$$

$$\frac{9y^2}{9} = \frac{16}{9}$$

$$\sqrt{y^2} = \sqrt{\frac{16}{9}}$$

$$y = \pm \frac{4}{3}$$

$$15) 2g^2 - 32 = -32$$

$$2g^2 = -32 + 32$$

$$\frac{2g^2}{2} = \frac{0}{2}$$

$$\sqrt{g^2} = \sqrt{0}$$

$$g = 0$$

$$16) 4a^2 = 36$$

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

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

$$a = \pm 3$$

$$17) 7x^2 + 28 = 0$$

$$\frac{7x^2}{7} = \frac{-28}{7}$$

$$x^2 = -4$$

No solution

$$18) 6n^2 - 54 = 0$$

$$\frac{6n^2}{6} = \frac{54}{6}$$

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

$$n = \pm 3$$

8.5

Model each problem with a quadratic equation. Then solve.

19.) Round to the nearest tenth.

Find the side length of a square with an Area of 196 ft^2 .

$$x^2 = 196$$

$$\sqrt{x^2} = \sqrt{196}$$

$$x = \pm 14$$

20.) Find the radius of a circle with an area of 100 in^2 ,

$$A = \pi r^2$$

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

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

$$r = \pm 5.6 \text{ in}$$

21.) Find the side length of a square with an area of 500 cm^2 .

$$x^2 = 500$$

$$\sqrt{x^2} = \sqrt{500}$$

$$x = 22.36$$

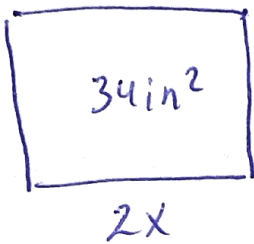
$$x = \pm 22.4 \text{ cm}$$

$$22) f(x) = -0.9x^2 + 2x + 7$$

use a graphing calculator to graph the function and approximate the x intercept to the nearest ~~hundred~~ hundredth. what are the zeros of the function?

$$-1.89 \text{ and } 4.11$$

23)



$$A = s^2$$

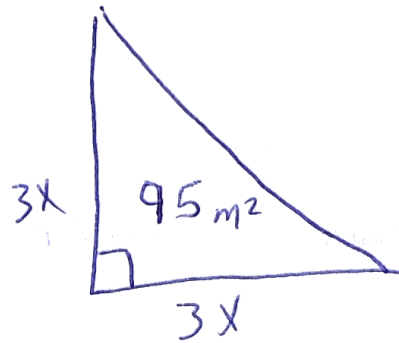
$$34 = (2x)^2$$

$$\frac{34}{4} = \frac{4x^2}{4}$$

$$\sqrt{\frac{17}{2}} = \sqrt{x^2}$$

$$2.9 = x$$

24.)



$$A = \frac{1}{2}bh$$

$$95 = \frac{1}{2}(3x)(3x)$$

$$(2)95 = \frac{(2)}{(1)} \frac{1}{2}(9x^2)$$

$$\frac{190}{9} = \frac{9x^2}{9}$$

$$\sqrt{\frac{190}{9}} = \sqrt{x^2}$$

$$4.59 = x$$

$$4.6 = x$$