



REVIEW SOLVING QUADRATICS WORKSHEET

Solve by factoring.

1.) $x^2 - 64 = 0$

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

$$x = 8, -8$$

2.) $8x^2 - 2x - 18 = -15$

$$\begin{array}{r} +15 \quad +15 \\ \hline 8x^2 - 2x - 3 = 0 \\ (4x-3)(2x+1) = 0 \\ 4x-3=0 \quad 2x+1=0 \\ +3 \quad +3 \quad 2x=-1 \\ \hline 4x=3 \Rightarrow x = \frac{3}{4} \quad x = -\frac{1}{2} \end{array}$$

3.) $x^2 + 3x = 40$

$$\begin{array}{r} -40 \quad -40 \\ \hline x^2 + 3x - 40 = 0 \\ (x+8)(x-5) = 0 \\ x = -8, 5 \end{array}$$

4.) $2x^2 + 3x + 1 = 0$

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

$$2x+1=0 \quad x=-1$$

$$2x=-1$$

$$x = -\frac{1}{2}$$

5.) $4x^2 - 8x = 3$

$$\begin{array}{r} -3 \quad -3 \\ \hline 4x^2 - 8x - 3 = 0 \\ \text{will not} \\ \text{factor} \end{array}$$

6.) $3x^2 + 6x - 42 = 0$

$$3(x^2 + 2x - 14) = 0$$

will not factor

Solve by square roots.

7.) $4x^2 = 81$

$$\begin{array}{r} \frac{4x^2}{4} = \frac{81}{4} \\ x^2 = \frac{81}{4} \\ x = \pm \sqrt{\frac{81}{4}} \\ x = \frac{9}{2}, -\frac{9}{2} \end{array}$$

8.) $(4x-3)^2 + 7 = 39$

simplify

$$\begin{array}{r} \sqrt{32} \quad 9.) \quad 5-6y^2=113 \\ \sqrt{16} \cdot \sqrt{2} \quad -5 \quad -5 \\ \hline (4x-3)^2 = 32 \\ \sqrt{(4x-3)^2} = \pm \sqrt{32} \\ 4x-3 = \pm \sqrt{32} \\ 4x-3 = \pm 4\sqrt{2} \\ +3 \quad +3 \\ \hline 4x = 3 \pm 4\sqrt{2} \\ x = \frac{3 \pm 4\sqrt{2}}{4} \end{array}$$

9.) $5 - 6y^2 = 113$

$$\begin{array}{r} -5 \quad -5 \\ \hline -6y^2 = 108 \\ -6^2 = -6 \\ y^2 = -18 \\ \sqrt{y^2} = \sqrt{-18} \\ \text{No real solution} \end{array}$$

10.) $(x-5)^2 = 36$

Solve by completing the square.

11.) $4x^2 - 8x = 3$

$$\begin{array}{r} 4(x^2 - 2x + \underline{1}) = 3 + 4 \\ 4(x-1)^2 = 7 \\ \frac{4(x-1)^2}{4} = \frac{7}{4} \\ (x-1)^2 = \frac{7}{4} \\ \sqrt{(x-1)^2} = \pm \sqrt{\frac{7}{4}} \\ x-1 = \pm \frac{\sqrt{7}}{2} \\ x = 1 \pm \frac{\sqrt{7}}{2} \end{array}$$

12.) $3x^2 + 6x - 42 = 0$

$$\begin{array}{r} 3(x^2 + 2x + \underline{1}) = 0 + 3 \\ 3(x+1)^2 = 3 \\ \frac{3(x+1)^2}{3} = \frac{3}{3} \\ (x+1)^2 = 1 \\ \sqrt{(x+1)^2} = \pm \sqrt{1} \\ x+1 = \pm 1 \\ x = -1 \pm 1 \\ \begin{cases} x = -1 + 1 = 0 \\ x = -1 - 1 = -2 \end{cases} \end{array}$$

For #13-15, write the expression for the discriminant. Use this to find the number of real solutions for each equation:

13.) $2x^2 - 3x + 1 = 0$

$$\begin{array}{r} a=2 \\ b=-3 \\ c=1 \\ b^2 - 4ac \\ 9 - 4(2)(1) = 1 \\ \text{2 real solutions} \end{array}$$

14.) $x^2 + 4x = -7$

$$\begin{array}{r} +7 \quad +7 \\ \hline x^2 + 4x + 7 = 0 \\ a=1 \\ b=4 \\ c=7 \\ b^2 - 4ac \\ 16 - 4(1)(7) = -12 \\ \text{No real solutions} \end{array}$$

15.) $x^2 + 9 = 6x$

$$\begin{array}{r} -6x \quad -6x \\ \hline x^2 - 6x + 9 = 0 \\ a=1 \\ b=-6 \\ c=9 \\ b^2 - 4ac \\ 36 - 4(1)(9) = 0 \\ \text{1 real solution} \end{array}$$

Solve using the quadratic formula.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

16.) $2x^2 + 5x - 3 = 0$
 $a = 2, b = 5, c = -3$

$$x = \frac{-5 \pm \sqrt{25 - 4(2)(-3)}}{2(2)}$$

$$x = \frac{-5 \pm \sqrt{49}}{4} = \frac{-5 \pm 7}{4}$$

$$\frac{-5+7}{4} = \frac{2}{4} = \frac{1}{2}$$

$$\frac{-5-7}{4} = \frac{-12}{4} = -3$$

17.) $2x^2 - 6x + 1 = 0$
 $a = 2, b = -6, c = 1$

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(2)(1)}}{2(2)}$$

$$x = \frac{6 \pm \sqrt{36 - 8}}{4} = \frac{6 \pm \sqrt{28}}{4}$$

$$\frac{6 + \sqrt{28}}{4} = \frac{6 + 2\sqrt{7}}{4} = \frac{3 + \sqrt{7}}{2}$$

$$\frac{6 - \sqrt{28}}{4} = \frac{6 - 2\sqrt{7}}{4} = \frac{3 - \sqrt{7}}{2}$$

19.) $x^2 - 2x + 5 = 0$
 $a = 1, b = -2, c = 5$

$$x = \frac{2 \pm \sqrt{4 - 4(1)(5)}}{2(1)}$$

$$\frac{2 \pm \sqrt{-16}}{2} \rightarrow \text{No real solutions}$$

20.) $6x + 9 = 2x^2 - 6x - 9$
 $a = 2, b = -6, c = -9$

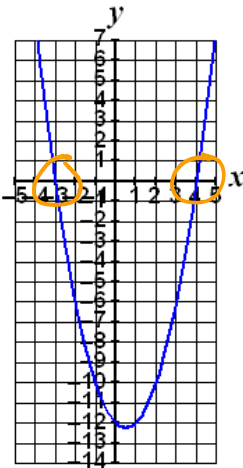
$$x = \frac{6 \pm \sqrt{36 - 4(2)(-9)}}{2(2)}$$

$$= \frac{6 \pm \sqrt{108}}{4} = \frac{6 \pm 6\sqrt{3}}{4} = \frac{3 \pm 3\sqrt{3}}{2}$$

Simplify $\sqrt{108} = \sqrt{36 \cdot 3} = 6\sqrt{3}$

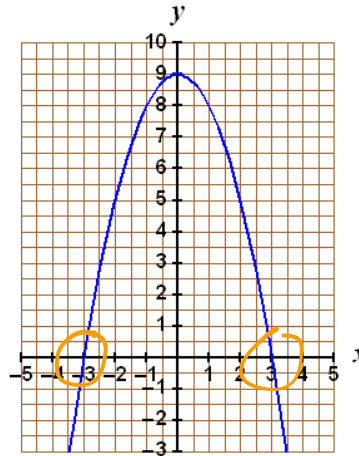
For #21-22, a quadratic function and its graph are shown. Identify the solutions, or roots, of the related quadratic equation.

21.) $f(x) = x^2 - x - 12$



Solve: $x = -3$ or 4

22.) $y = -x^2 + 9$



Solve: $x = -3$ or 3

For #23-24, translate and solve.

23.) One less than a positive number times three more than that number is 32. Find the number.

Let $n =$ positive number $(n-1)(n+3) = 32$

$$n^2 + 3n - n - 3 = 32$$

$$n^2 + 2n - 3 = 32$$

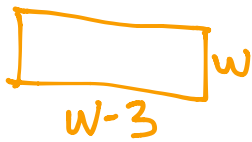
$$-32 - 32$$

$$n^2 + 2n - 35 = 0$$

$$(n+7)(n-5) = 0$$

$$n = -7, 5$$

24.) The length of a rectangle is three centimeters less than the width. If the area of the rectangle is 54cm^2 , find the dimensions of the rectangle.



Area = length \cdot width
 $54 = (w-3)w$
 $54 = w^2 - 3w$

$$\begin{array}{r} 54 = w^2 - 3w - 54 \\ -54 \\ \hline 0 = w^2 - 3w - 54 \\ 0 = (w-9)(w+6) \\ w = 9, -6 \\ l = 6 \end{array}$$

25.) Explain why $x^2 + 81 = 0$ DOES NOT have a real solution.

It does not have a real solution because you must take $\sqrt{-81}$.

26.) Which method can't you use to solve this problem? $x^2 - 47 = 0$

Circle one: Factoring Square Roots Quadratic Formula

Explain why: There are no factors of -47 that you can add to get 0.

27.) Which method can't you use to solve this problem? $x^2 + 7x = 0$

Circle one: Factoring Square Roots Quadratic Formula

Explain why: There is a "b" term.

28.) Which method can you use to solve all quadratic equations?

Circle one: Factoring Square Roots Quadratic Formula

Explain why: You can always plug in a, b, c even if any of them = 0.

29.) What are the **two mistakes** in setting up the quadratic formula:

Solve: $2x^2 - x - 6 = 0$

$$x = \frac{-1 \pm \sqrt{(-1)^2 - 4(2)(6)}}{2(2)}$$

-b should be $-(-1) = 1$ forgot sign