

Pg. 49 in MVP: Solving Quads

SET

Topic: Solve Quadratic Equations Efficiently

For each of the given quadratic equations find the solutions using an efficient method. State the method you are using as well as the solutions. You must use at least three different methods.

5. $x^2 + 17x + 60 = 0$ 6. $x^2 + 16x + 39 = 0$ 7. $x^2 + 7x - 5 = 0$

8. $3x^2 + 14x - 5 = 0$ 9. $x^2 - 12x = -8$ 10. $x^2 + 6x = 7$

Summarize the process for solving a quadratic by the indicated strategy. Give examples along with written explanation, also indicate when it is best to use this strategy.

11. Completing the Square

12. Factoring

13. Quadratic Formula

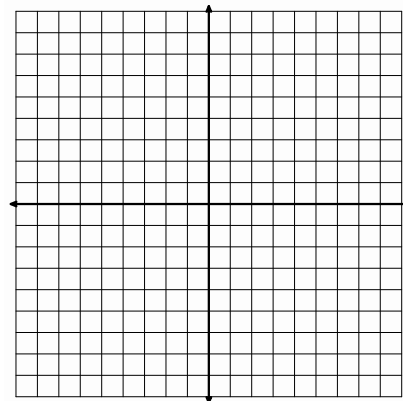
GO

Topic: Graphing Quadratics and finding essential features of the graph. Solving systems of equations.

Graph the quadratic function and supply the desired information about the graph.

14. $f(x) = x^2 + 8x + 13$

- a. Line of symmetry:
- b. x-intercepts:
- c. y-intercept:
- d. vertex:



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5) 5. $x^2 + 17x + 60 = 0$

$$(x+5)(x+12) = 0$$

$$x = -5 \quad x = -12$$

$$x^2 + 17x + 60 = 0$$

$$x^2 + 17x + \sqrt{\frac{289}{4}} = -60 + \frac{289}{4}$$

$$\downarrow \left(\frac{17}{2}\right)^2 = \frac{289}{4}$$

$$\sqrt{\left(x + \frac{17}{2}\right)^2} = \sqrt{\frac{49}{4}}$$

$$x + \frac{17}{2} = \pm \frac{7}{2}$$

$$\begin{matrix} -\frac{17}{2} & & -\frac{17}{2} \\ \hline x = & +\frac{7}{2} - \frac{17}{2} & -\frac{7}{2} - \frac{17}{2} \\ & -5 & -12 \end{matrix}$$

$$x = -5$$

$$x + \frac{17}{2} = \pm \frac{7}{2}$$

$$-7/2 - 17/2 = -12$$

$$7/2 - 17/2$$

$$-7/2 - 17/2$$

6) $x^2 + 16x + 39 = 0$

$$(x+13)(x+3) = 0$$

$$x = -13 \quad x = -3$$

$$x^2 + 16x + 64 = -39 + 64$$

$$\sqrt{(x+8)^2} = \sqrt{25}$$

$$x+8 = \pm 5$$

$$\begin{matrix} -8 & & -8 \\ \hline x = & -8 \pm 5 & \\ & -8+5 & -8-5 \\ & -3 & -13 \end{matrix}$$

$$x = -8 \pm 5$$

$$-8+5$$

$$-3$$

$$-8-5$$

$$-13$$

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

+5 +5

$$x^2 + 7x + \frac{49}{4} = 5 + \frac{49}{4}$$

$$\left(\frac{7}{2}\right)^2 = \frac{49}{4}$$

$$\sqrt{\left(x + \frac{7}{2}\right)^2} = \sqrt{\frac{69}{4}}$$

$$x + \frac{7}{2} = \pm \sqrt{\frac{69}{4}}$$

$-\frac{7}{2}$ $-\frac{7}{2}$

$$x = -\frac{7}{2} \pm \sqrt{\frac{69}{4}}$$

$$x = -\frac{7}{2} + \sqrt{\frac{69}{4}}$$

$$x = -\frac{7}{2} - \sqrt{\frac{69}{4}}$$

$$8) 3x^2 + 14x - 5 = 0$$

+5 +5

$$3x^2 + 14x = 5$$

$$3\left(x^2 + \frac{14}{3}x + \frac{196}{36}\right) = 5 + 3 \cdot \frac{196}{36}$$

$$\frac{14}{3} \cdot \frac{1}{2} = \left(\frac{14}{6}\right)^2 = \frac{196}{36}$$

$$3\left(x + \frac{14}{6}\right)^2 = \frac{64}{3} \cdot \frac{1}{3}$$

$$\sqrt{\left(x + \frac{14}{6}\right)^2} = \sqrt{\frac{64}{9}}$$

$$x + \frac{14}{6} = \pm \frac{8}{3}$$

$-\frac{14}{6}$ $-\frac{14}{6}$

$$x = -\frac{14}{6} + \frac{8}{3}$$

= 1

$$x = -\frac{14}{6} - \frac{8}{3}$$

$$= -5$$

$$3x^2 + 14x - 5 = 0$$

$$x^2 + 14x - 15 = 0$$

$$\left(x + \frac{15}{3}\right)\left(x - \frac{1}{3}\right)$$

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

$$x = -5 \quad x = \frac{1}{3}$$

$$\begin{aligned}
 9) \quad x^2 - 12x &= -8 \\
 x^2 - 12x + 36 &= -8 + 36 \\
 \sqrt{(x-6)^2} &= \sqrt{28} \\
 x-6 &= \pm\sqrt{28} \\
 x-6 &= \pm 2\sqrt{7} \\
 \boxed{x = 6 \pm 2\sqrt{7}} \\
 \underbrace{\phantom{x = 6 \pm 2\sqrt{7}}}_{6+2\sqrt{7}} \quad \underbrace{\phantom{x = 6 \pm 2\sqrt{7}}}_{6-2\sqrt{7}}
 \end{aligned}$$

$$\begin{array}{r}
 2 \overline{)28} \\
 \underline{2} \\
 14 \\
 \underline{14} \\
 0
 \end{array}$$

$$\begin{aligned}
 10) \quad x^2 + 6x &= 7 \\
 x^2 + 6x + 9 &= 7 + 9 \\
 (x+3)^2 &= 16 \\
 x+3 &= \pm 4 \\
 x &= \pm 4 - 3 \\
 4-3 & \quad -4-3 \\
 = 1 & \quad = -7
 \end{aligned}$$

$$\begin{aligned}
 x^2 + 6x &= 7 \\
 x^2 + 6x - 7 &= 0 \\
 (x+7)(x-1) &= 0 \\
 \boxed{x = -7 \quad x = 1}
 \end{aligned}$$

