

Directions: Solve each quadratic by the stated method. Show all work for credit.

1. Solve the equation by graphing.

$$-x^2 - 6x - 8 = 0$$

$$a = -1 \quad b = -6 \quad c = -8$$

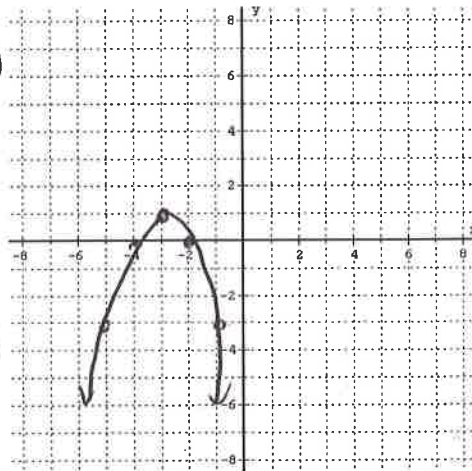
Vertex:

$$\frac{-b}{2a} = \frac{6}{2(-1)} = \frac{6}{-2} = -3$$

$$y_{\text{par}} + \begin{matrix} -(-3)^2 - 6(-3) - 8 \\ \downarrow \\ -9 + 18 - 8 \\ \quad 9 - 8 = 1 \end{matrix}$$

Vertex (-3, 1)  
a-value = -1  
1a, 3a, 5a  
-1, -3, -5

Solutions:  
 $x = -2 \text{ \& } -4$



2. Solve the equation by using square roots.

$$4(x-1)^2 + 2 = 18$$

$$\begin{matrix} -2 & -2 \\ 4(x-1)^2 = 16 \\ \hline 4 & 4 \end{matrix}$$

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

$$\begin{matrix} X-1 = 2 \text{ \& } -2 \\ +1 & +1 & +1 \end{matrix}$$

$X = 3 \text{ \& } -1$

3. Solve each equation by factoring.

a.  $x^2 - 8x = -12$

$$\begin{matrix} 12 \cdot 1 \\ 6 \cdot 2 \\ 4 \cdot 3 \\ x^2 - 8x + 12 = 0 \\ (x-6)(x-2) = 0 \\ x-6=0 \quad x-2=0 \\ \boxed{x=6 \text{ \& } 2} \end{matrix}$$

b.  $2x^2 - 16x = 12x - 48$

$$\begin{matrix} 24 \cdot 1 \\ 12 \cdot 2 \\ 2x^2 - 16x = 12x - 48 \\ -12x \quad -12x \\ 2x^2 - 28x + 48 = 0 \\ 2(x^2 - 14x + 24) = 0 \\ 2(x-12)(x-2) = 0 \\ 2=0 \quad x-12=0 \quad x-2=0 \\ \boxed{x=12 \text{ \& } 2} \end{matrix}$$

4. Solve by completing the square.

$$x^2 - 8x - 5 = 0$$

$$\begin{matrix} \downarrow -16 \\ (x^2 - 8x + 16 - 16) - 5 = 0 \\ (4)^2 = 16 \end{matrix}$$

$$(x^2 - 8x + 16) - 21 = 0$$

$$(x-4)^2 - 21 = 0$$

$$\sqrt{(x-4)^2} = \sqrt{21}$$

$$x-4 = \pm\sqrt{21}$$

$x = 4 \pm \sqrt{21}$

5. Solve by using the quadratic formula:

$$2x^2 + 3x - 4 = 0$$

$$\begin{matrix} a=2 \quad b=3 \quad c=-4 \\ -3 \pm \sqrt{9 - 4(2)(-4)} \\ \hline 2(2) \end{matrix}$$

$$-3 \pm \sqrt{9 + 32}$$

$$\begin{matrix} 4 \\ -3 \pm \sqrt{41} \\ \hline 4 \end{matrix}$$

Now solve