

Solve each equation by factoring.

1) $2x^2 - 5x - 7 = 0$

$$(2x-7)(x+1) = 0$$

$$x = 7/2, x = -1$$

2) $x^2 - 17x = -72$

$$x^2 - 17x + 72 = 0$$

$$(x-9)(x-8) = 0$$

$$x = 8, 9$$

3) $3x^2 + 12x = 0$

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

$$x = 0, -4$$

Solve each equation using complete the square.

4) $x^2 + 14x - 47 = 0$

$$x^2 + 14x + 49 = 47 + 49$$

$$(x+7)^2 = 96$$

$$x+7 = \pm\sqrt{96} \quad \frac{16}{6}$$

$$x+7 = \pm 4\sqrt{6}$$

$$x = -7 \pm 4\sqrt{6}$$

5) $\frac{1}{2}x^2 + 8x = 1$

$$x^2 + 16x = 2$$

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

$$(x+8)^2 = 66$$

$$x+8 = \pm\sqrt{66}$$

$$x = -8 \pm \sqrt{66}$$

6) $x^2 - 10x = -9$

$$x^2 - 10x + 25 = -9 + 25$$

$$(x-5)^2 = 16$$

$$x-5 = \pm 4$$

$$x = 5 \pm 4$$

$$x = 9, 1$$

Solve each equation using the quadratic formula (either by calculator or by hand).

7) $x^2 + 3x + 11 = 0$

$$\frac{-3 \pm \sqrt{9 - 4(1)(11)}}{2}$$

$$\frac{-3 \pm \sqrt{9-44}}{2} = \frac{-3 \pm i\sqrt{35}}{2}$$

8) $5x^2 + 2x = 8$

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

$$\frac{-2 \pm \sqrt{4 - 4(5)(-8)}}{10}$$

$$\frac{-2 \pm \sqrt{4+160}}{10}$$

$$\frac{-2 \pm \sqrt{164}}{10}$$

$$\frac{-2 \pm 2\sqrt{41}}{10} = \frac{-1 \pm \sqrt{41}}{5}$$

Solve each equation using any method.

9) $4x^2 = 9$ $4x^2 - 9 = 0$

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

$$x = \pm 3/2$$

10) $\frac{-10}{x} = \frac{x+1}{-3}$ $x^2 + x = 30$

$$x^2 + x - 30 = 0$$

$$(x+6)(x-5) = 0$$

$$x = -6, 5$$

Determine the vertex using the form: $y = a(x-h)^2 + k$, the axis of symmetry, and the direction of opening.

11) $y = -3(x - \frac{1}{4})^2 + \frac{1}{2}$

$V = (\frac{1}{4}, \frac{1}{2})$
 aos: $x = \frac{1}{4}$
 opens: DOWN

12) $f(x) = x^2 + 10x - 35$

$y = x^2 + 10x + 25 - 35 - 25$
 $y = (x+5)^2 - 60$

$V = (-5, -60)$
 aos: $x = -5$
 opens: UP

13) $y = -2x^2 + 24x - 59$

$\frac{y}{-2} = x^2 - 12x + \frac{59}{2}$
 $\frac{y}{-2} = x^2 - 12x + 36 + \frac{59}{2} - 36$
 $\frac{y}{-2} = (x-6)^2 + \frac{59}{2} - 36$
 $y = -2(x-6)^2 - \frac{59+72}{13}$

$V = (6, 13)$
 aos: $x = 6$
 opens: DOWN

Determine the vertex using $x = \frac{-b}{2a}$

14) $f(x) = -x^2 + 10x - 18$

$x = \frac{-10}{-2} = 5$ (5)

$y = -1 \cdot 5^2 + 10(5) - 18$
 $y = -25 + 50 - 18$
 $y = 7$

$V = (5, 7)$

15) $y = 4x^2 - 8x + 7$

$x = \frac{8}{8} = 1$ (1)

$y = 4(1)^2 - 8(1) + 7$
 $y = 4 - 8 + 7$
 $y = 3$

$V = (1, 3)$

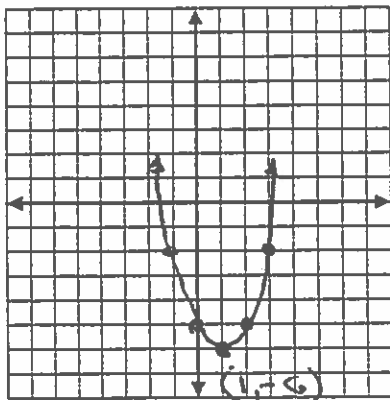
16) $y = -6x^2 + 13$

$V = (0, 13)$

Graph the following quadratic equations using either method. Make sure there are a total of 5 points (including the vertex).

$y = x^2 - 2x - 5 = -1$

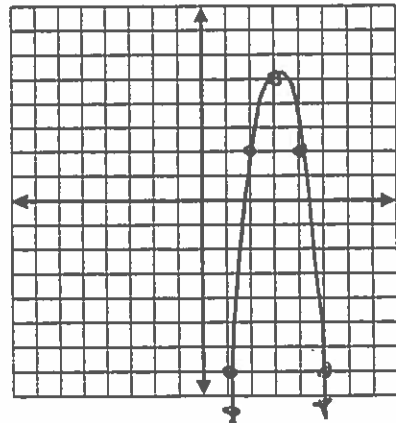
17) $y = x^2 - 2x - 5$ $y = (x-1)^2 - 6$



$x = \frac{-18}{-6} = 3$

18) $f(x) = -3x^2 + 18x - 22$

$V(3, 5)$



x	y
3	5
4	2
5	-5