Put the following equation in vertex form.

$y = x^2 - 16x - 7$

$y + 7 = x^2 - 16x + 64$

$+64$

$y + 71 = (x-8)^2$

$y = (x-8)^2 - 71$

Give the vertex. Tell whether the vertex is a maximum or minimum value. Give the y-intercept.

$V(8, -71)$ minimum

$(0, -7)$

What are the x-intercepts of the function.

$y = (x-8)^2 - 71$

$0 = (x-8)^2 - 71$

$+71 \qquad +71$

$\sqrt{71} = \sqrt{(x-8)^2}$

$x - 8 = \pm\sqrt{71}$

$x = 8 \pm \sqrt{71}$

$y = x^2 - 16x - 7$

Put each equation in vertex form and give the vertex

$y = x^2 + 8x + 3$

$y - 3 = x^2 + 8x + 16$

$+16$

$y + 13 = (x+4)^2$

$y = (x+4)^2 - 13$

$V(-4, -13)$

$y = -x^2 + 5x - 3$

$\frac{y}{-1} = x^2 - 5x + 3$

$\frac{y}{-1} - 3 = x^2 - 5x + \frac{25}{4}$

$+\frac{25}{4}$

$\frac{y}{-1} + \frac{13}{4} = (x - \frac{5}{2})^2$

$-1\left(\frac{y}{-1}\right) = -1\left[(x - \frac{5}{2})^2\right] + \left(\frac{13}{4}\right)(-1)$

$y = -(x - \frac{5}{2})^2 + \frac{13}{4}$

$V(\frac{5}{2}, \frac{13}{4})$

$y = 3x^2 + 9x - 4$

$\frac{16}{12} + \frac{27}{12}$

$\frac{y}{3} = x^2 + 3x - \frac{4}{3}$

$\frac{y}{3} + \frac{4}{3} = x^2 + 3x + \frac{9}{4}$

$+\frac{9}{4}$

$\frac{y}{3} + \frac{43}{12} = (x + \frac{3}{2})^2$

$3\left(\frac{y}{3}\right) = 3\left((x + \frac{3}{2})^2\right) - \left(\frac{43}{12}\right)3$

$y = 3(x + \frac{3}{2})^2 - \frac{43}{4}$

$V(-\frac{3}{2}, -\frac{43}{4})$

Solve each quadratic by completing the square. Identify each solution as rational, irrational, or complex.

$y = 2(x-2)^2 - 18$

$\frac{18}{2} = \frac{2(x-2)^2}{2}$

$\sqrt{9} = \sqrt{(x-2)^2}$

$\pm 3 = x - 2$

$x = 2 - 3 \quad -1$

$x = 2 + 3 \quad 5$

Rational

$y = -2x^2 + 10x - 14$

$-7 = -\frac{28}{4}$

$+\frac{25}{4}$

$-\frac{3}{4}$

$\frac{0}{-2} = \frac{-2x^2}{-2} + \frac{10x}{-2} - \frac{14}{-2}$

$= x^2 - 5x + 7$

$-7 = x^2 - 5x + \frac{25}{4}$

$+\frac{25}{4}$

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

$x - \frac{5}{2} = \pm \frac{\sqrt{3}}{2} i$

$x = \frac{5}{2} \pm \frac{\sqrt{3}}{2} i$

Complex

$15x = x^2 + 7x + 6$

$-15x \quad -15x$

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

$-6 = x^2 - 8x + 16$

$+16$

$\sqrt{10} = \sqrt{(x-4)^2}$

$x - 4 = \pm\sqrt{10}$

$x = 4 \pm \sqrt{10}$

Irrational

Solve each quadratic by using the quadratic formula. Leave your answer in radical form. Identify each solution as rational, irrational, or complex.

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

$y = 4x^2 - 3x + 1$

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

$$\frac{3 \pm \sqrt{9-16}}{8}$$

$$\frac{3 \pm \sqrt{-7}}{8}$$

$$\frac{3}{8} \pm \frac{\sqrt{7}}{8}i$$

Complex

$y = 8x^2 - 2x - 15$

$$\frac{2 \pm \sqrt{(-2)^2-4(8)(-15)}}{2(8)}$$

$$\frac{2 \pm \sqrt{4-(-480)}}{16}$$

$$\frac{2 \pm \sqrt{484}}{16}$$

$$\frac{2 \pm 22}{16}$$

$$\frac{2+22}{16} \quad \frac{2-22}{16}$$

$$\frac{3}{2} \quad -\frac{5}{4}$$

Rational

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

$2x^2 + 6x + 9 = 0$

$$\frac{-6 \pm \sqrt{(6)^2-4(2)(9)}}{2(2)}$$

$$\frac{-6 \pm \sqrt{36-72}}{4}$$

$$\frac{-6 \pm \sqrt{-36}}{4}$$

$$\frac{-6 \pm 6i}{4}$$

$$-\frac{3}{2} \pm \frac{3}{2}i$$

Complex

Solve the quadratic equation. When applicable, write your answer in radical form. Solve by each method (complete the square, quadratic formula) at least once. Identify each solution as rational, irrational, or complex.

$m^2 + 25 = -8m$

$m^2 + 8m = -25$

$m^2 + 8m + 16 = -25 + 16$

$(m+4)^2 = -9$

$m + 4 = \pm 3i$

$m = -4 \pm 3i$

Complex

$4x^2 = 11x + 20$

$4x^2 - 11x - 20 = 0$

$\frac{11 \pm \sqrt{(-11)^2 - 4(4)(-20)}}{2(4)}$

$\frac{11 \pm \sqrt{121 - (-320)}}{8}$

$\frac{11 \pm \sqrt{441}}{8}$

$\frac{11 \pm 21}{8}$

Rational

$\frac{11+21}{8}$ $\quad$ $\frac{11-21}{8}$

4 $\quad$ $-\frac{5}{4}$

$5x^2 - 4x + 6 = 0$

$\frac{4 \pm \sqrt{(-4)^2 - 4(5)(6)}}{2(5)}$

$\frac{4 \pm \sqrt{16 - 120}}{10}$

Complex

$\frac{4 \pm \sqrt{-104}}{10}$

$\frac{4}{10} \pm \frac{\sqrt{104}}{10} i$

$\frac{2}{5} \pm \frac{\sqrt{104}}{10} i$

$2x^2 + 2x - 8 = 10$

$x^2 + x - 4 = 5$

$x^2 + x + \frac{1}{4} = 9 + \frac{1}{4}$

$\left(x + \frac{1}{2}\right)^2 = \frac{37}{4}$

$x + \frac{1}{2} = \pm \frac{\sqrt{37}}{2}$

Irrational

$-\frac{1}{2} \pm \frac{\sqrt{37}}{2}$

Preform the indicated operation. Make sure your answer is in standard form $a+bi$

$i^2 = -1$

$-3 - 5i - 2 - i$

$-5 - 6i$

$-i + (7 - 5i) - 3(2 - 3i)$

$-i + 7 - 5i - 6 + 9i \qquad 1 + 3i$

$3i(6 - 7i) = 18i - 21i^2$

$21 + 18i$

$(2 + 3i)(7 - i) = 14 - 2i + 21i - 3i^2$

$14 + 19i + 3$

$17 + 19i$

$(-1 + 3i)(3 - i) + (2 + 4i)(-1 + 2i)$

$-3 + i + 9i - 3i^2 \qquad -2 + 4i - 4i + 8i^2$

$10i \qquad -10$

$-10 + 10i$

$\frac{2 - 3i}{-5 + 2i} \quad \frac{(-5 - 2i)}{(-5 - 2i)}$

$\frac{-10 - 4i + 15i + 6i^2}{25 + 10i - 10i - 4i^2}$

$\frac{-16 + 11i}{29}$

Graph the following equation.

$y = -(x-2)^2 + 6$

Vertex (2, 6)

A.O.S x = 2

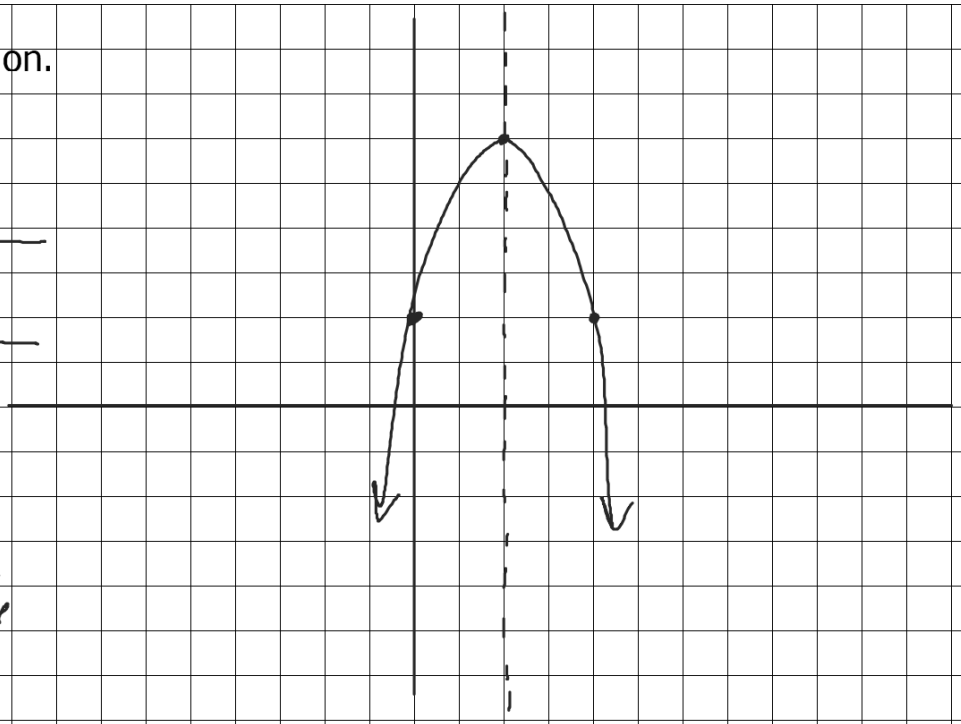
max / min

y-intercept

$-(0-2)^2 + 6$

$-4 + 6$

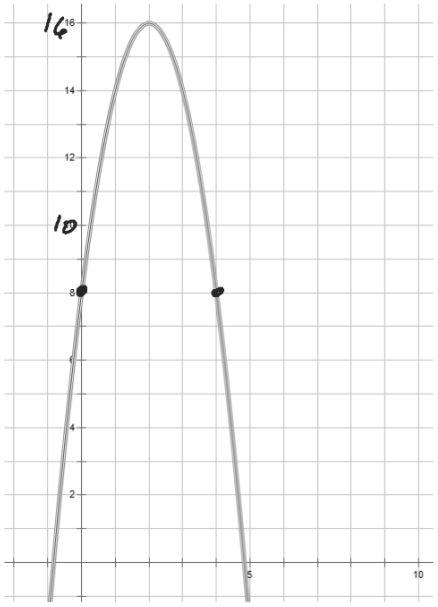
2



Graph the following equation.

$y = (x + 5)^2 - 1$

Write the equation for the given curve



h k
V(2,16)

(0,8)
x y

$y = a(x-h)^2 + k$

$8 = a(0-2)^2 + 16$

$8 = 4a + 16$

$-8 = 4a$

$a = -2$

$y = -2(x-2)^2 + 16$

Write the equation for the given curve