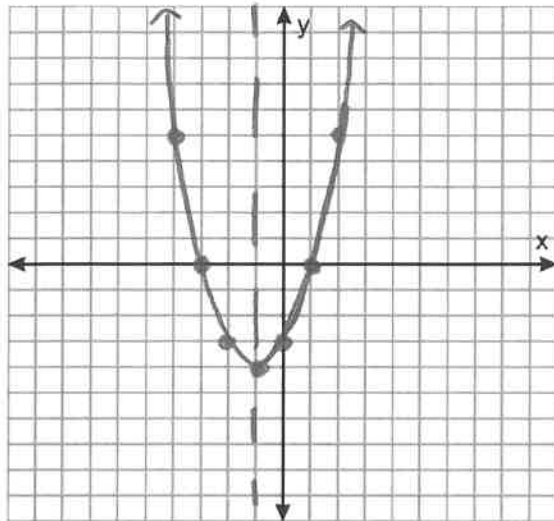


Review 4.1-4.4

1. Find the y-intercept, axis of symmetry, and the vertex of the function $f(x) = x^2 + 2x - 3$. Then graph the function labeling at least 2 points.



y-int : $(0, -3)$

AoS

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

vertex

$$\begin{aligned} f(-1) &= (-1)^2 + 2(-1) - 3 \\ &= -4 \end{aligned}$$

$(-1, -4)$

2. Determine whether the function $f(x) = 2x^2 - 8x + 9$ has a maximum or minimum and calculate that max/min.

minimum b/c $a > 0$

min value is 1
@ $x = 2$

$$\begin{aligned} x &= -\frac{(-8)}{2(2)} = 2 & f(2) &= 2(2)^2 - 8(2) + 9 \\ & & &= 8 - 16 + 9 \end{aligned}$$

3. Solve the equations below: = 1

a. $x^2 - 2x = 3$

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

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

$$x = -1, 3$$

c. $3x^2 = 10 - 13x$

$$3x^2 + 13x - 10 = 0$$

$$(3x - 2)(x + 5) = 0$$

$$x = \frac{2}{3}, -5$$

b. $x^2 + 4x - 7 = 0$

*calculator or quad formula

$$x = -5.317, 1.317$$

d. $x^2 + 4x = 45$

$$x^2 + 4x - 45 = 0$$

$$(x+9)(x-5) = 0$$

$$x = 5, -9$$

4. Using a calculator solve the equations below:

a. $f(x) = x^2 + 2x - 2$

$$x = -2.732, 0.732$$

b. $g(x) = x^2 + 7x - 4$

$$x = -7.531, 0.531$$

5. Solve $5x^2 + 100 = 0$

$$5x^2 = -100$$

$$x^2 = -20$$

$$x = \pm \sqrt{-20} = \pm 2i\sqrt{5}$$

6. Solve $(x+1)^2 = -4$

$$x+1 = \pm \sqrt{-4}$$

$$x+1 = \pm 2i$$

$$x = -1 \pm 2i$$

7. Write a quadratic equation with the given roots:

a. -6 and 2

$$\begin{aligned} f(x) &= (x+6)(x-2) \\ &= x^2 + 4x - 12 \end{aligned}$$

b. $\frac{2}{3}$ and -4

$$\begin{aligned} f(x) &= (3x-2)(x+4) \\ &= 3x^2 + 12x - 2x - 8 \\ &= 3x^2 + 10x - 8 \end{aligned}$$

8. Solve for x and y given $4x - 2 + 7yi = 6 - 14i$

$$4x - 2 = 6$$

$$x = 2$$

$$7y = -14$$

$$y = -2$$

9. Simplify the following and write answers in standard form (a+bi):

a. $\sqrt{-80} = i\sqrt{16 \cdot 5}$

$$= 4\sqrt{5}i$$

d. $(7-3i)(8+4i)$

$$= 56 + 28i - 24i - 12i^2$$

$$= 56 + 4i + 12$$

$$= 68 + 4i$$

b. $\sqrt{-6} \cdot \sqrt{-12}$

$$i\sqrt{6} \cdot i\sqrt{12}$$

$$i^2 \sqrt{72}$$

$$= -6\sqrt{2}$$

c. $(6-9i) - (-17-12i)$

$$6-9i+17+12i$$

$$23+3i$$

b. $\frac{2+i}{3-i} \cdot \frac{3+i}{3+i}$

$$= \frac{6+3i+2i+i^2}{9-i^2}$$

$$= \frac{6+5i-1}{9+1}$$

$$= \frac{5+5i}{10}$$

$$= \frac{1}{2} + \frac{1}{2}i$$

$$*i^2 = -1$$

$$\sqrt{72} = \sqrt{36 \cdot 2}$$