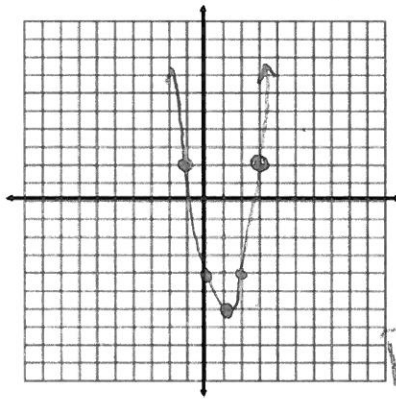


3A-SC Quadratic Functions in Vertex Form

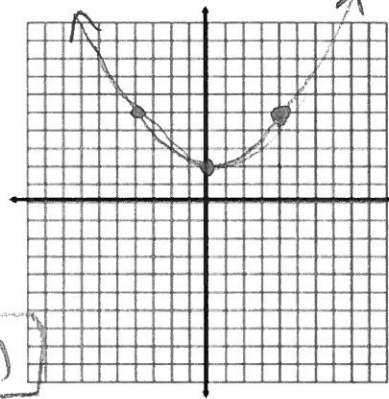
Provide the following information about the given functions, then graph:

1. $f(x) = 2(x-1)^2 - 6$ Range: $y \geq -6$
 y-int: $(0, -4)$ # of x-int: two
 $f(-5) = 66$ $f(5) = 26$



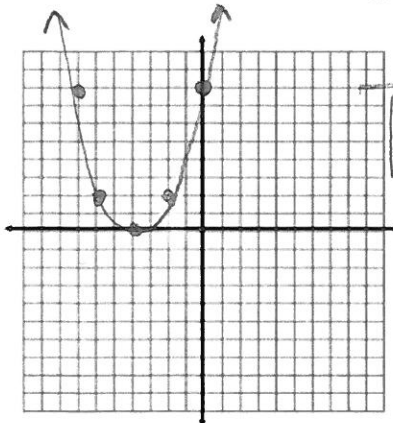
x-int:
 $2(x-1)^2 - 6 = 0$
 $2(x-1)^2 = 6$
 $\sqrt{(x-1)^2} = \sqrt{3}$
 $x = 1 \pm \sqrt{3}$
 $(1-\sqrt{3}, 0) (1+\sqrt{3}, 0)$

3. $f(x) = \frac{3}{4}x^2 + 2$ Range: $y \geq 2$
 y-int: $(0, 2)$ # of x-int: none
 $f(-8) = 50$ $f(8) = 50$



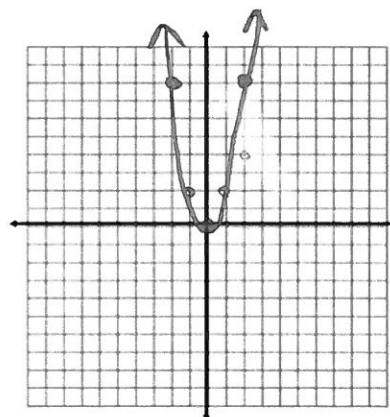
x-int: none
 $\frac{3}{4}x^2 + 2 = 0$
 $\frac{3}{4}x^2 = -2 \cdot \frac{4}{3}$
 $\sqrt{x^2} = \sqrt{-\frac{8}{3}}$
 $x = \pm \frac{\sqrt{24} \cdot i}{3}$
 $x = \pm \frac{2\sqrt{6}i}{3}$

2. $f(x) = \frac{1}{2}(x+4)^2$ Range: $y \geq 0$
 y-int: $(0, 8)$ # of x-int: one
 $f(-5) = \frac{1}{2}$ $f(5) = \frac{81}{2}$



x-int: $(-4, 0)$

4. $f(x) = 2x^2$ Range: $y \geq 0$
 y-int: $(0, 0)$ # of x-int: one
 $f(-3/4) = \frac{9}{8}$ $f(3/4) = \frac{9}{8}$



x-int: $(0, 0)$

5. For each of the following quadratics: Solve and classify the x-intercepts using square roots. If the root(s) is/are irrational, simplify and rationalize.

1. $x^2 - 9 = 0$

$$x^2 = 9$$

$$x = \pm 3$$

2. $4x^2 = 108$

$$\frac{4x^2}{4} = \frac{108}{4}$$

$$x^2 = 27$$

$$x = \pm 3\sqrt{3}$$

3. $3(x-3)^2 - 42 = 0$

$$\frac{3(x-3)^2}{3} = \frac{42}{3}$$

$$\sqrt{(x-3)^2} = \pm\sqrt{14}$$

$$x = 3 \pm \sqrt{14}$$

$$\frac{39+3}{3} = 14$$

4. $-\frac{1}{2}(x-1)^2 + 4 = 2$

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

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

$$x-1 = \pm 2$$

$$x = 1 \pm 2$$

$$x = -1, 3$$

5. $3(x+2)^2 = 12$

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

$$x+2 = \pm 2$$

$$x = -4, 0$$

6. $\frac{1}{2}(3x+5)^2 = 24$

$$\sqrt{(3x+5)^2} = \sqrt{48} = 4\sqrt{3}$$

$$3x+5 = \pm 4\sqrt{3}$$

$$x = \frac{-5 \pm 4\sqrt{3}}{3}$$