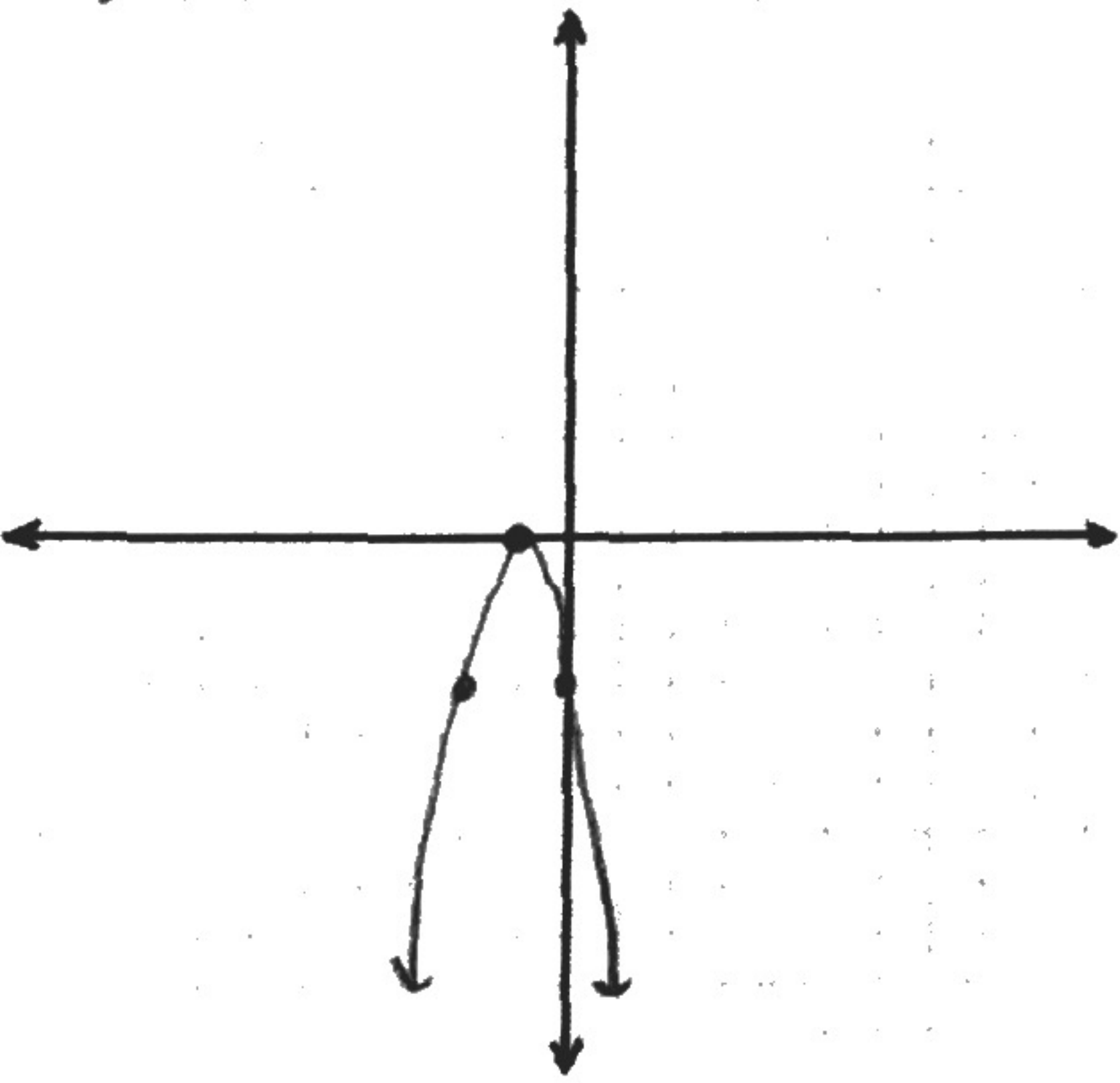


Unit 2: Graphing Quadratic Functions PBA Practice

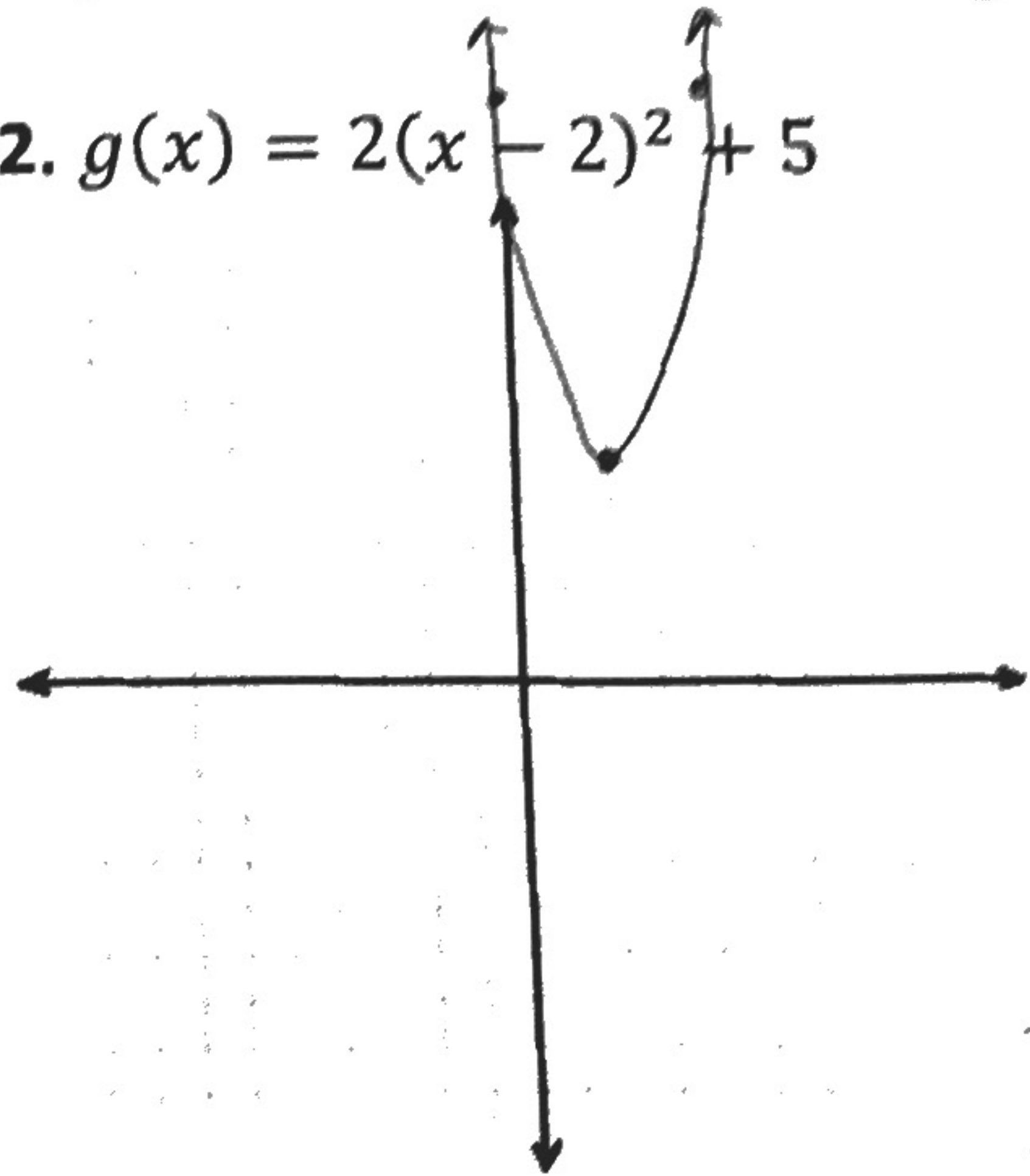
Find the vertex, axis of symmetry, y-intercept, and x-intercepts of each function. Then graph the function.

1. $f(x) = -3(x + 1)^2$



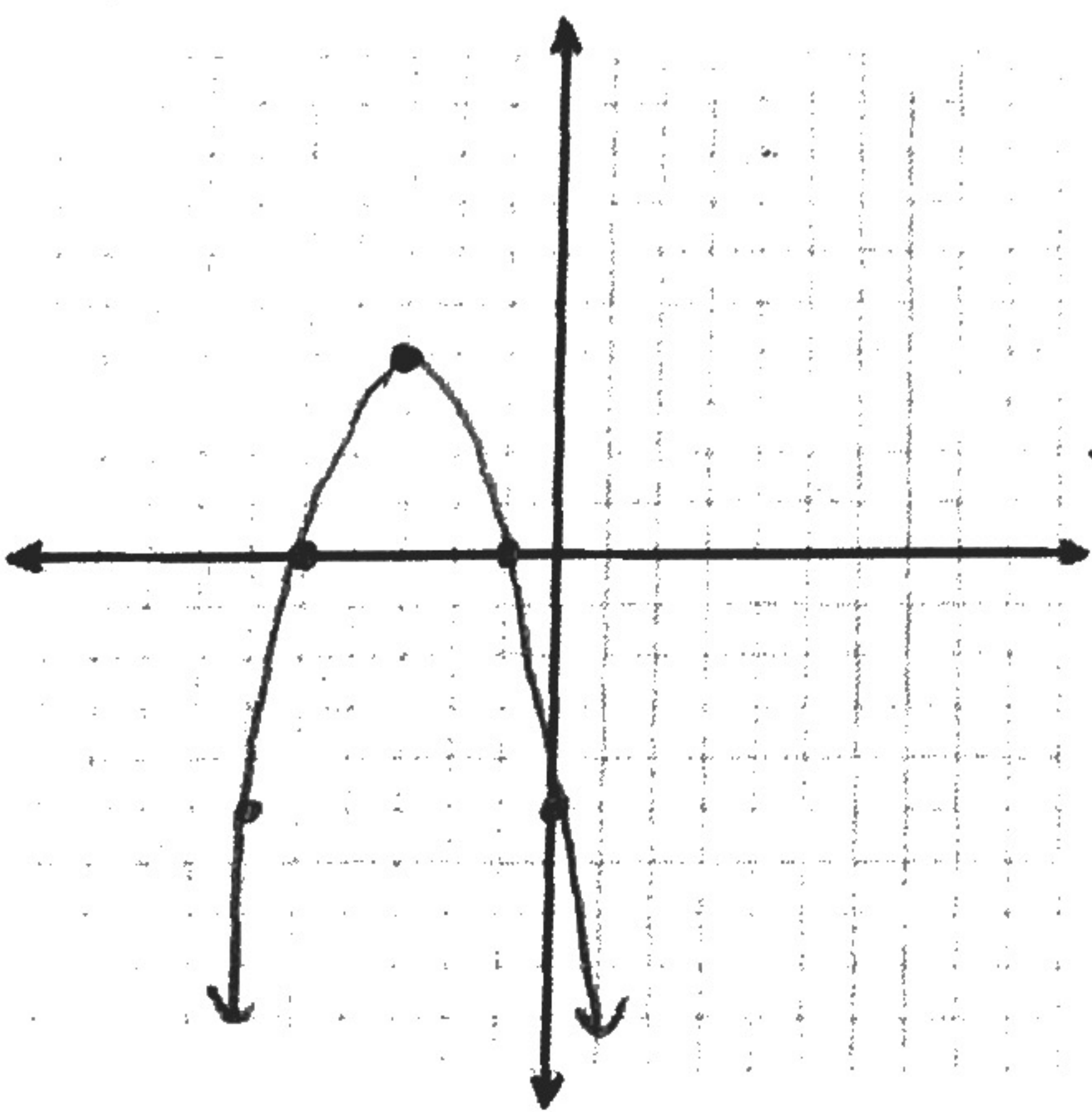
vertex: $(-1, 0)$
 axis: $x = -1$
 y-int: $f(0) = -3(0+1)^2 = -3$
 x-int: $0 = -3(x+1)^2$
 $0 = (x+1)^2$
 $0 = x+1$
 $-1 = x$

2. $g(x) = 2(x - 2)^2 + 5$



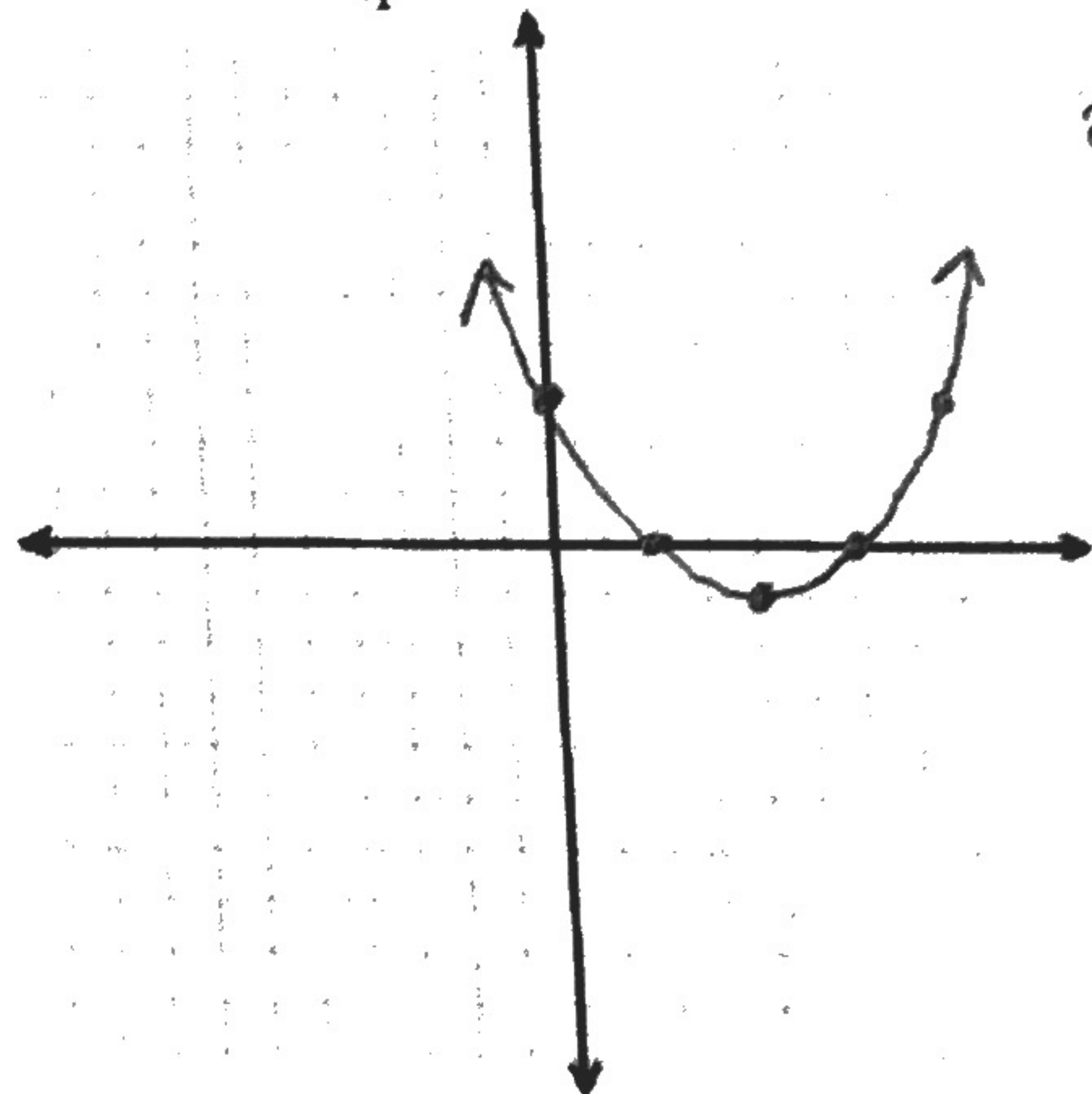
vertex: $(2, 5)$
 axis: $x = 2$
 y-int: $f(0) = 2(0-2)^2 + 5 = 13$
 x-int: $0 = 2(x-2)^2 + 5$
 $-5 = 2(x-2)^2$
 $-\frac{5}{2} = (x-2)^2$ none
 $\pm \sqrt{\frac{5}{2}} = x - 2$
 $x = 2 \pm \sqrt{\frac{5}{2}}$

3. $f(x) = -(x + 1)(x + 5)$



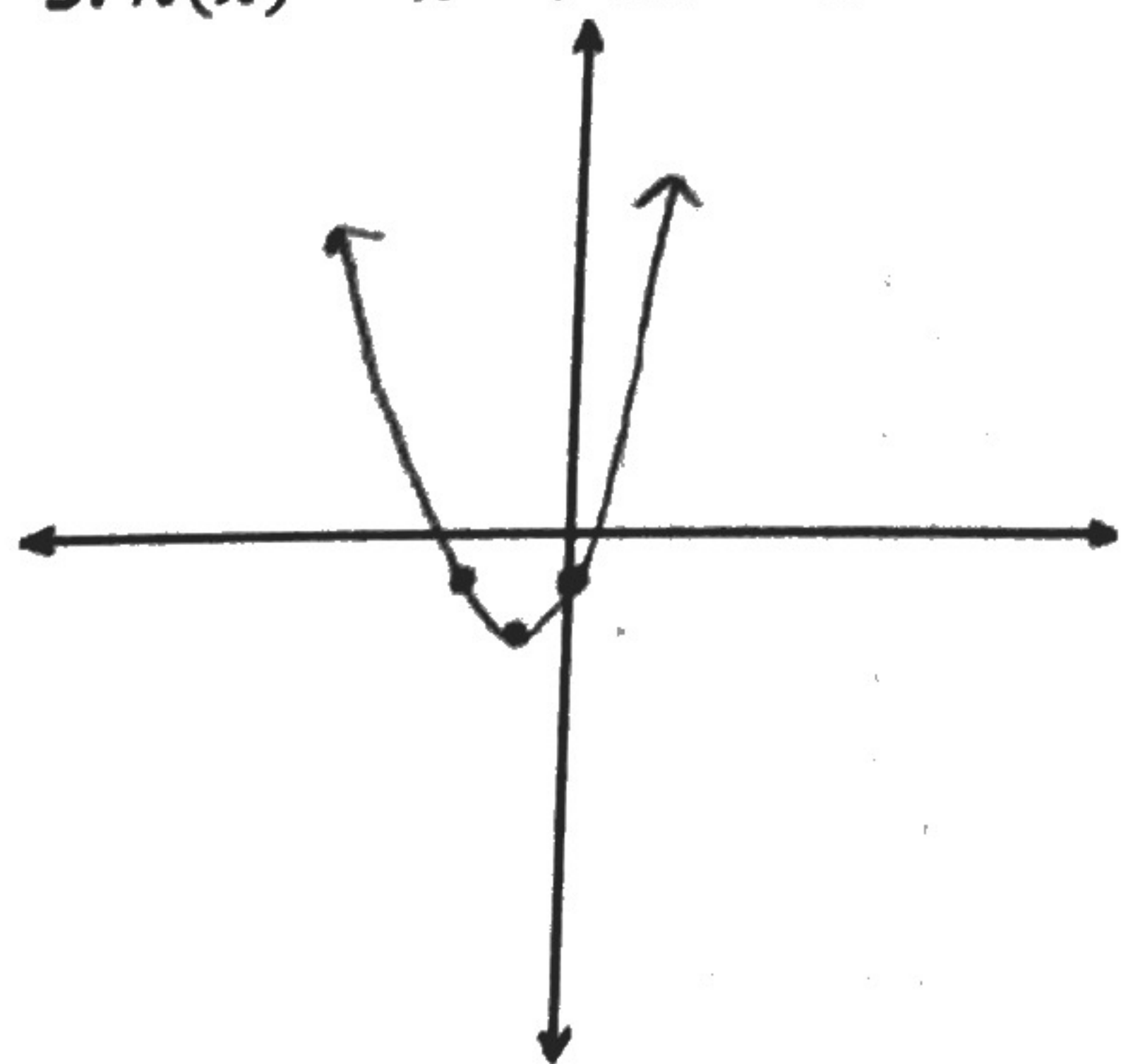
x-int: $p = -1, q = -5$
 axis: $x = \frac{-1 + (-5)}{2} = -3$
 vertex: $(-3, 4)$
 $f(-3) = -(-3+1)(-3+5) = 4$
 y-int: $f(0) = -(0+1)(0+5)$
 $f(0) = -5$

4. $g(x) = \frac{1}{4}(x - 6)(x - 2)$



x-int: $p = 6, q = 2$
 axis: $x = \frac{6+2}{2} = 4$
 vertex: $(4, -1)$
 $f(4) = \frac{1}{4}(4-6)(4-2)$
 y-int: $f(0) = \frac{1}{4}(0-6)(0-2)$
 $f(0) = 3$

$$5. h(x) = x^2 + 2x - 1$$



$$y\text{-int: } -1$$

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

$$\text{vertex: } (-1, -2)$$

$$h(-1) = (-1)^2 + 2(-1) - 1 = -2$$

$$x\text{-ints: } 0 = x^2 + 2x - 1$$

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

$$x = \frac{-2 \pm \sqrt{4+4}}{2}$$

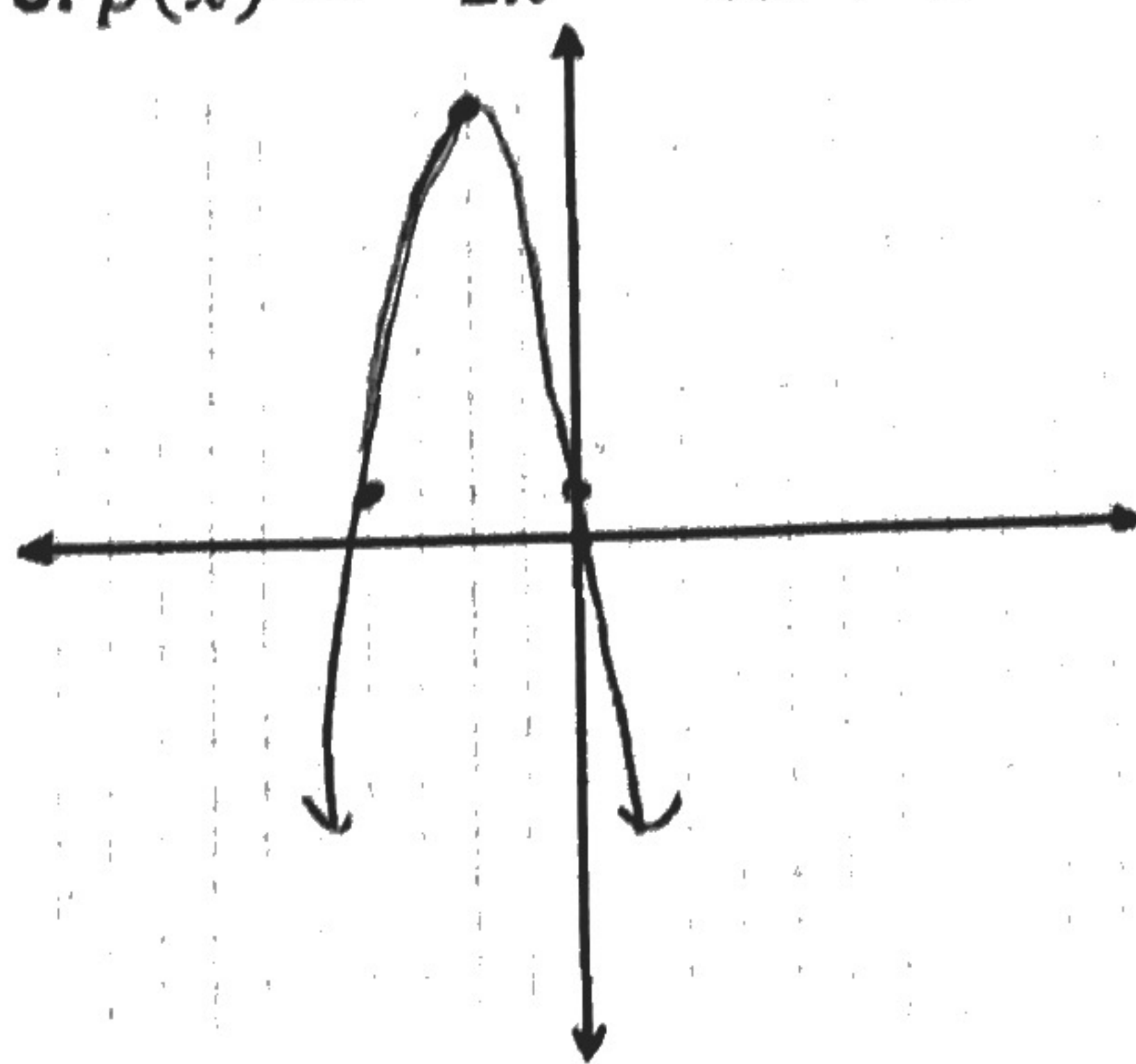
$$x = \frac{-2 \pm \sqrt{8}}{2}$$

$$x = \frac{-2 \pm 2\sqrt{2}}{2}$$

$$x = -1 \pm \sqrt{2}$$

$$x = -1 + \sqrt{2}, x = -1 - \sqrt{2}$$

$$6. p(x) = -2x^2 - 8x + 1$$



$$y\text{-int: } 1$$

$$\text{axis: } x = \frac{8}{2(-2)} = -2$$

$$\text{vertex: } (-2, 9)$$

$$p(-2) = -2(-2)^2 - 8(-2) + 1 = 9$$

$$x\text{-ints: } 0 = -2x^2 - 8x + 1$$

$$x = \frac{8 \pm \sqrt{(-8)^2 - 4(-2)(1)}}{2(-2)}$$

$$x = \frac{8 \pm \sqrt{64+8}}{-4}$$

$$x = \frac{8 \pm \sqrt{72}}{-4}$$

$$x = \frac{-8 \pm 6\sqrt{2}}{-4}$$

$$x = \frac{4 \pm 3\sqrt{2}}{2}$$

$$x = \frac{4+3\sqrt{2}}{2}, x = \frac{4-3\sqrt{2}}{2}$$