

Answers to Worksheet Lessons 35 and 36, Section 3.1 of textbook

1)

- a) vertex $V(0, -1)$
- b) opens upward
- c) axis of symmetry: $x = 0$
- d) y-intercept: -1
- e) x-intercepts: $1, -1$
- f) minimum value is -1 when $x = 0$

2)

- a) vertex $V(-3, -12)$
- b) opens upward
- c) axis of symmetry: $x = -3$
- d) y-intercept: -3
- e) x-intercepts: $-3 + 2\sqrt{3}, -3 - 2\sqrt{3} \approx -0.46, -6.46$
- f) minimum value of -12 when $x = -3$

3)

- a) vertex $V\left(-\frac{3}{2}, \frac{49}{2}\right)$
- b) opens downward
- c) axis of symmetry: $x = -\frac{3}{2}$
- d) y-intercept: 20
- e) x-intercepts: $-5, 2$
- f) maximum value of $\frac{49}{2}$ when $x = -\frac{3}{2}$

4)

- a) vertex: $V\left(2, -\frac{9}{2}\right)$
- b) opens upward
- c) axis of symmetry: $x = 2$
- d) y-intercept: $-\frac{5}{2}$
- e) x-intercepts: $-1, 5$
- f) minimum value of $-\frac{9}{2}$ when $x = 2$

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

6) $f(x) = -\frac{1}{12}(x-3)^2 + 5$

7) $f(x) = -\frac{1}{3}(x+2)^2 + 3$

8) $f(x) = \frac{3}{16}(x-4)^2 + 7$

9) $h = -2, k = 1, a = 1$
Therefore: $f(x) = (x+2)^2 + 1$

10) $h = 3, k = 1, a = -1$
Therefore: $f(x) = -(x-3)^2 + 1$

11) $a = -4, h = 2, k = 6$
Therefore: $f(x) = -4(x-2)^2 + 6$

12) $a = 2, h = 1, k = -5$
Therefore: $f(x) = 2(x-1)^2 - 5$

13) $a = \frac{1}{2}, h = -2, k = -2$
Therefore: $f(x) = \frac{1}{2}(x+2)^2 - 2$

14) axis: $x = 5$
point symmetric to $(3, 10)$ is $(7, 10)$

15) axis: $x = 1$
point symmetric to $(-1, 10)$ is $(3, 10)$

16) axis: $x = -1$
point symmetric to $(5, -36)$ is $(-7, -36)$