

## Pre-calculus Unit 2 Review Answers

1. Vertex Form  $f(x) = (x - 3)^2 - 1$   
Vertex  $(3, -1)$  Axis of Symmetry  $x = 3$
2. Vertex Form  $f(x) = -(x - 2)^2 + 4$   
Vertex  $(2, 4)$  Axis of Symmetry  $x = 2$
3. minimum, opens up, value  $= -\frac{49}{8}$
4. maximum, opens down, value  $= 11$
5. x-intercepts  $(-\frac{1}{2}, 0), (-\frac{5}{3}, 0)$  y-intercept  $(0, 5)$
6.  $y = -2(x - 3)^2 + 5$
7.  $y = \frac{1}{3}(x + 2)^2 + 1$
- 8a. 216 ft by 432 ft
- 8b. 93,312  $ft^2$
- 9a.  $R(x) = -\frac{1}{6}x^2 + 60x$
- 9b. 180 lamps
- 9c. Maximum revenue = \$5400
- 9d. \$30

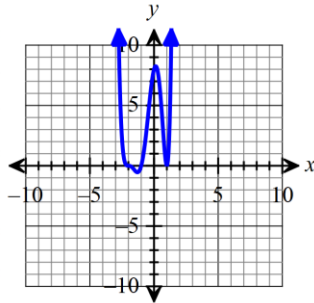
$$19. x = -1, x = -5 + i, x = -5 - i$$

$$f(x) = (x + 1)(x + 5 - i)(x + 5 + i)$$

$$20. x = 3, x = -1, x = 4i, x = -4i$$

$$f(x) = (x - 3)(x + 1)(x - 4i)(x + 4i)$$

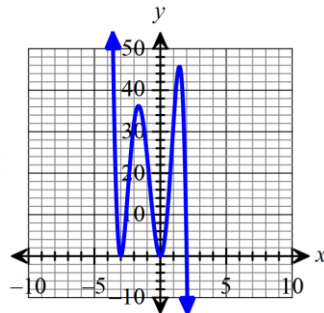
10.



Zeros	Multiplicity	Touch/Cross
-2	3 odd	Cross
1	2 even	Touch
-1	1 odd	cross

$$\lim_{x \rightarrow -\infty} f(x) = \infty \quad \lim_{x \rightarrow \infty} f(x) = \infty$$

11.



Zeros	Multiplicity	Touch/Cross
0	2 even	touch
2	1 odd	cross
-3	2 even	touch

$$\lim_{x \rightarrow -\infty} f(x) = \infty \quad \lim_{x \rightarrow \infty} f(x) = -\infty$$

$$12. 4x^2 + 9x + 4 + \frac{8}{5x-4}$$

$$13. x^3 + x^2 + 4x + 14 + \frac{62}{x-4}, \text{ not a factor because there is a remainder}$$

$$14. \pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 12, \pm \frac{1}{3}, \pm \frac{2}{3}, \pm \frac{4}{3}$$

$$15. f(x) = (x + 3)(x - 1)(x - 2 + i)(x - 2 - i)$$

$$16. f(x) = (x - 2)(x - 3i)(x + 3i)(x + 1 - 4i)(x + 1 + 4i)$$

$$17. x = -\frac{1}{3}, x = 2 + \sqrt{2}, x = 2 - \sqrt{2}$$

$$f(x) = (3x + 1)(x - 2)(x - 2 - \sqrt{2})(x - 2 + \sqrt{2})$$

$$18. x = -2, x = \frac{1}{2}, x = 2i, x = -2i$$

$$f(x) = (x + 2)(2x - 1)(x - 2i)(x + 2i)$$