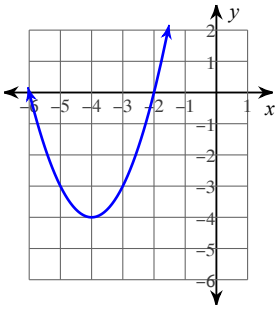
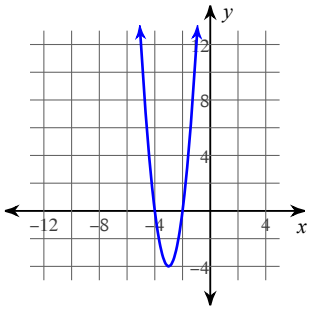
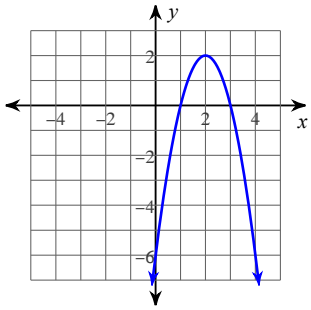
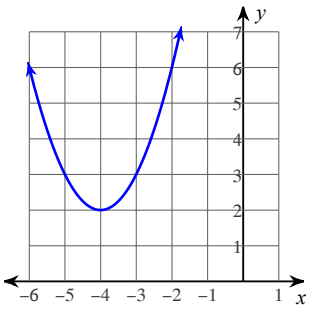
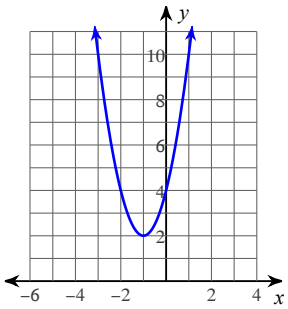
Answers to Term 2 Final Review

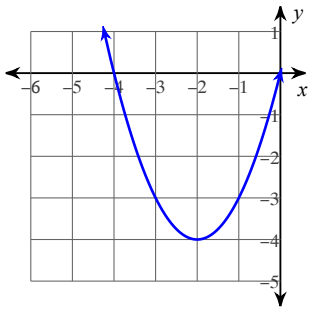
1) 

2) 

3) 

4) 

5) 

6) 

7) $y = 2(x+4)^2 - 2$
Vertex $(-4, -2)$

8) $y = -(x+3.5)^2 + 12.25$
Vertex: $(-3.5, 12.25)$

9) $y = -\frac{2}{5}(x-2)(x+3)$

10) $y = \frac{11}{36}(x+6)(x+1)$

11) $y = -\frac{3}{4}(x-2)^2$

12) $y = \frac{5}{4}(x-2)^2 - 5$

13) a. 18 yards
b. 21.23 yards
c. Yes. The goal post is only 10 feet tall, which is 3.3 yards tall, so the ball clears the goal post by 17.89 yards.
d. D: [0,36] R:[0,23]

14) $y = \frac{9}{6250}(x-250)^2$

15) a. 0.19 seconds
b. 28.56 feet
c. 27 feet, 18 feet
d. 1.52 seconds
e. D: [0, 1.52] R:[0, 28.56]

16) a. 63.4 feet
b. 1.62 seconds
c. 80.75 feet
d. 5.12 seconds

17) $g(x) = -2(x+2)^2 + 2$

18) $g(x) = -\frac{1}{3}\sqrt{x-3} + 3$

19) compress vertically by a factor of 3
reflect across the x-axis
translate left 2 units
translate up 3 units

20) expand vertically by a factor of 3
reflect across the x-axis
translate right 1 unit
translate up 3 units

21) $\frac{10}{3}$

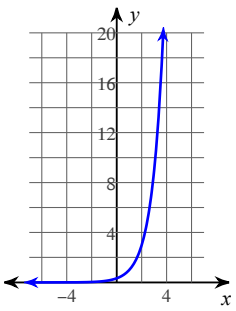
22) $\frac{6}{5}$

23) 2

24) 0

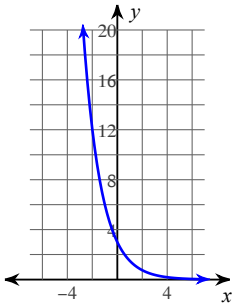
25) $2,017.33

26) 29.52 grams

27) 

28) a. $(-\infty, \infty)$
b. $(0, \infty)$
c. $(-\infty, \infty)$
d. None
e. As $x \to -\infty$, $y \to 0$
As $x \to \infty$, $y \to \infty$

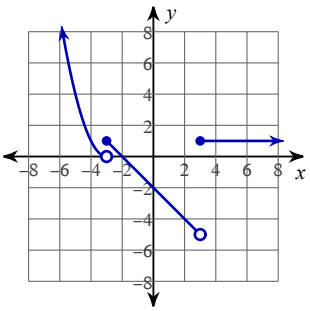
29) a. $(-\infty, \infty)$
b. $(0, \infty)$
c. None
d. $(-\infty, \infty)$
e. As $x \to -\infty$, $y \to \infty$
As $x \to \infty$, $y \to 0$

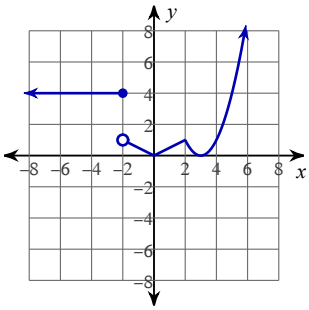
30) 

31) Initial: 12
Decay factor: 0.87
Decay rate: 13%

32) Initial: 1
Growth factor: 1.23
Growth rate: 23%

33) a. Undefined
b. 26
c. -1
d. 17

34) 

35) 

36) $f(x) = \begin{cases} (x+3)^2 + 2, & x < -2 \\ -2x - 2, & -2 \le x < 2 \\ 2(x-3)^2 - 2, & x \ge 2 \end{cases}$

37) $g(x) = \begin{cases} \frac{1}{2}x, & x < -2 \\ 3, & -1 \le x < 4 \\ -(x-4)^2, & x \ge 4 \end{cases}$

38) Jane is warming up for a run. She jogs at a certain pace for the first 2 minutes. She increases her speed for the next minute, and then she rests and stretches for 5 minutes. She then starts jogging back to where she started at a cool-down pace.

39) Exponential

40) Linear

41) Quadratic

42) Exponential

43) $\begin{bmatrix} \frac{7}{9} & \frac{10}{9} \\ \frac{1}{3} & \frac{1}{3} \end{bmatrix}$

44) $\begin{bmatrix} -2 & -\frac{5}{3} \\ 3 & \frac{8}{3} \end{bmatrix}$

45) $\begin{bmatrix} 2 & -\frac{11}{2} & -4 \\ -7 & \frac{37}{2} & 13 \\ -1 & 3 & 2 \end{bmatrix}$

46) $\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -5 \\ -1 \end{bmatrix}$

47) $\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -5 \\ -2 \end{bmatrix}$

48) $\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 1 \\ -5 \\ 0 \end{bmatrix}$

49) $(-3, 0), (0, -6)$

50) $(2, -2), (5, 1), (8, -2)$

51) $(-1, 0), (0, 1), (1, 0)$

52) $(-4, -1), (-3, 0)$

53) $(x-3)^2 + (y+7)^2 = 45$

54) $(x+10)^2 + (y-6)^2 = 245$

55) $(0, -2), (-4, 2)$

56) $(-1 + \sqrt{5}, 3 + 2\sqrt{5}), (-1 - \sqrt{5}, 3 - 2\sqrt{5})$

57) No solution

58) $(-2, 0), (0, -4), (2, 0)$