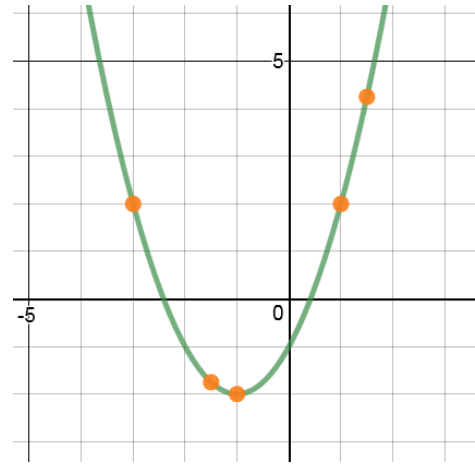Final Review Answers

1. A. 3 ft
   B. 28 ft
   C. x = 102.92 ft which falls far short of the outfield wall.

2. $D(w) = \begin{cases} 532 - 2m & 0 \le m \le 2 \\ 528 - 3.5(m-2) & 2 < m \le 5 \end{cases}$

3. A. $-3x + 9$
   B. $4x^2 - 24x + 36$
   C. $-2y^2 + 11y - 8$
   D. $-6\sqrt{5} + 14$

4. A. $-5x^5 + 3x^3 + x - 4$, degree: 5, lead coefficient: $-5$
   B. Not a polynomial

5. A. $x^2(3x - 8)(3x + 8)$
   B. $(x^2 - 5)(x + 2)$
   C. $(2x + 5)(x - 3)$
   D. $3x(x - 1)(x + 1)(x - 2)(x + 2)$

6. A. $x = 6,\ x = -5$
   B. $x = -11,\ x = -\dfrac{1}{2}$
   C. $x = -\dfrac{1}{2}$
   D. $x = 5$
   E. $x = -4 \pm \sqrt{20}$
   F. $x = \pm\dfrac{7}{4}$
   G. $x = 123$
   H. $x = 254$

7. A. $x = -2 \pm \sqrt{\dfrac{15}{2}}$
   B. $x = -4 \pm \sqrt{6}$

8. A. $x = 3$ from solving but if you check your answer this gives you a divide by zero so it is not a solution.
   B. $x = 5,\ x = 2$ again checking answers x=2 does not work.
   C. $x = 8,\ or\ x = -\dfrac{46}{7}$

**9.**

| x | −3 | −3/2 | −1 | 1 | 3/2 |
|---|----|------|----|---|-----|
| y | 2  | −7/4 | −2 | 2 | 17/4 |

**10.A.** $x_{int\ ercept} = \left(\dfrac{16}{3}, 0\right)$

$y_{int\ ercept} = (0,\ 4)$

**B.** $x_{int\ ercept} = (-3,\ 0),\ (3,\ 0),\ (-1,\ 0)$

$y_{int\ ercept} = (0,\ -9)$

**C.** $x_{int\ ercept}\quad none$

$y_{int\ ercept} = (0,\ 1),\ (0,\ 4)$

**11.** $(-2,\ 4),\ r = 6$

**12.**

**13.** $(x-3)^2 + (y-7)^2 = 80$

**14.** $y = \dfrac{7}{3}x + 71$

**15.**

A. $f(x):\ D = \Re,\ x \ne 7$

B. $g(x):D = \Re,\ x \ge -4$

C. $h(x):D = \Re$

**16.**

A. $h(-5) = -47$

B. $h\left(\dfrac{3}{8}\right) = \dfrac{87}{32}$

C. $h(x-4) = -2x^2 + 16x - 29$

17. $x = 0,\ 2,\ -6$

18. $y = -7x - 12$

19. A.  down 5

    B.  right 5

    C.  down 2, right 3

    D.  up 2, left 1, reflect over the x-axis

    E.  up 11, left 2, reflect over the x-axis

    F.  down 8, left 3, reflect over the y-axis

    G.  up 1, left 2, reflect over the y-axis

    H.  left 4, up 3, reflect over the y-axis, reflect over the x-axis

20. A.  $y = (x+2)^3 + 3$

    B.  $y = -|x-8| + 3$

    C.  $y = \sqrt{x+5} + 1$

21. A.  $(f+g)(x) = 2x - 6$

    B.  $(f-g)(x) = -6x + 18$

    C.  $(fg)(x) = (6-2x)(4x-12)$

    D.  $\left(\dfrac{f}{g}\right)(x) = \dfrac{6-2x}{4x-12} = \dfrac{-2(-3+x)}{4(x-3)} = -\dfrac{1}{2}$

       $D:\ \Re,\ x \neq 3$

22. A.  $(f \circ g)(x) = -8x + 30,\ D:\ \Re$

    B.  $(j \circ h)(x) = x - 7,\ D:\ \Re$

    C.  $(g \circ g)(x) = 16x - 60,\ D:\ \Re$

23.  A.  $(f+g)(-3) = -12$

    B.  $(f-g)(2) = 6$

    C.  $(fg)(-4) = -392$

    D.  $\left(\dfrac{h}{j}\right)(20) = \dfrac{4}{397}$

24. A.  $f^{-1}(x) = -\dfrac{1}{2}x + 3$

    B.  $h^{-1}(x) = x^2 + 4$

    C.  $D:\ \Re,\ x \geq 4$

25. $x = -4.16,\ 2.16$

26. $x = 3$

27. $x_{int\ ercept} = (7,\ 0),\ (-13, 0)$

28. $y = \dfrac{5}{64}(x-6)^2 - 1$

29. A.  Down on the left, up on the right.

    B.  Down on the right, up on the left.

    C.  Down on the right, up on the left.

30. A.  $10x + 7 + \dfrac{5}{x^2 + 2x}$,  not a factor

    B. $3x + 8 + \dfrac{48}{x-6}$,  not a factor

    C. $x^3 + x^2 + 7x + 9 + \dfrac{96}{x-7}$,  not a factor

    D. $x - 3 + \dfrac{12}{x+3}$,  not a factor

31.

$$-3\ \begin{array}{|ccccc} 2 & 7 & -4 & -27 & -18 \\ & -6 & -3 & 21 & 18 \\ \hline 2 & 1 & -7 & -6 & 0 \end{array}$$

$$2\ \begin{array}{|cccc} 2 & 1 & -7 & -6 \\ & 4 & 10 & 6 \\ \hline 2 & 5 & 3 & 0 \end{array}$$

$(x+3)(x-2)(2x^2 + 5x + 3)$



(-1.5, 0)  (-1, 0)  (2, 0)  (-3, 0)
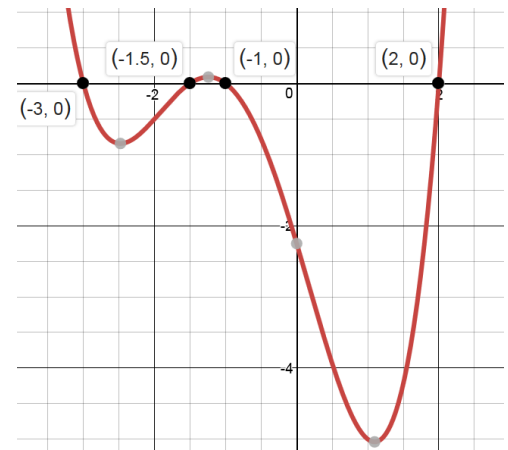
32.

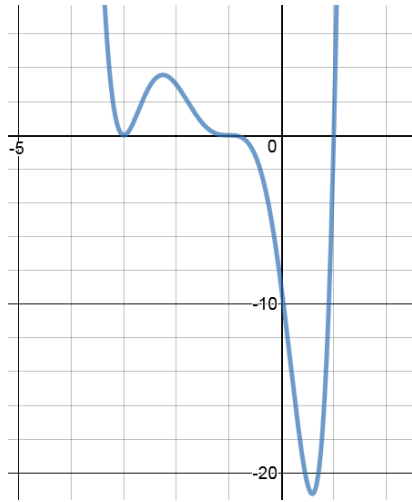    $(x+3)(x-2)(2x+3)(x+1)$

    $x = -13,\ 2,\ -\dfrac{3}{2},\ -1$

33. $D:\ \Re,\ x \neq 0,\ 2,\ 3$

34. A.  $\dfrac{-2 \pm \sqrt{-16}}{-2}$  Since there is a negative in the square root it means the roots are imaginary so the graph does not touch the x-axis.
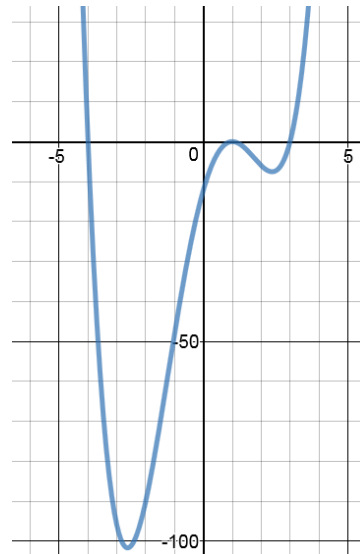
    B.  $\dfrac{-4 \pm \sqrt{112}}{6}$  so $x = 1.097\ or\ -2.431$.  The graph will cross the axis at each x value.

35. A.



B.



*(The scale of the bumps does not need to match. This was graphed on the computer so will look slightly different than what we have done by hand.)*

36.

A.

$D: (-\infty, \infty)$
$R: [-1, \infty)$

| Increasing | Decreasing | Constant |
|---|---|---|
| $[-2, 7]$ | $(-\infty, -2]$ | none |

B.

$D: (-\infty, \infty)$
$R: [-1, \infty)$

| Increasing | Decreasing | Constant |
|---|---|---|
| $[-5, 3], (3, \infty)$ | $(-\infty, -5]$ | none |

37. $f(x) = -(x-a)^3 - b$

38. $f(x) = |x+a| + b$

39. $f(x) = 3(x+2)^2 - 17$

40. $y = \dfrac{4}{11}x - \dfrac{106}{11}$