Answers to MA 15910 Review Worksheet for Exam 1, Spring 2016
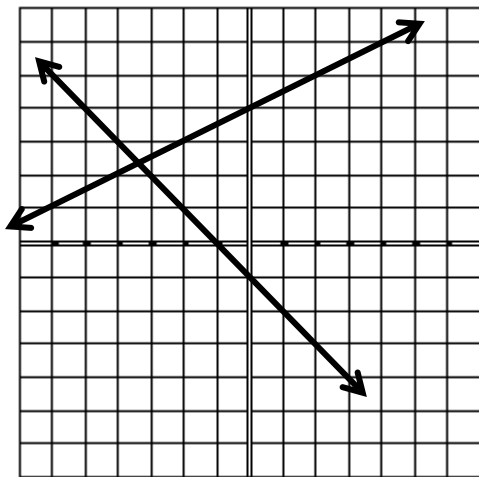
1)   a)   4 terms, degree 3, leading term is $-x^3$
       b)   5 terms, degree 4, leading term is n^4

2) $5x + 9xy + 6x^2 y - 10xy^2$

3)   a) $4a^2 + 2a - 8$ b) $2n^3 + 12n^2 - 5n + 5$
       c) $\frac{13}{12}a + \frac{22}{15}$

4) $15r + 13$

5)   a)   It is not a function. $D = \{-3,\ -1,\ 0,\ 1,\ 2,\ 3,\ 5,\ 9\}$ $R = \{-6,\ 0,\ 1,\ 2,\ 4,\ 5,\ 8,\ 10\}$
       b)   It is a function. $D = [0,4]$ $R = [-2,2]$
       c)   It is a function. $D = (-\infty, \infty)$ $R = [0, \infty)$
       d)   It is a function. $D = [5, \infty)$ $R = [0, \infty)$
       e)   It is a function. $D = (-\infty, 2) \cup (2, \infty)$, Range is difficult to determine
       f)   It is not a function. $D = [0, \infty)$ $R = (-\infty, \infty)$

6)   a) $f(3) = 7$ b) $g(-1) = 1$
       c) $h(3a - 2) = \dfrac{6a + 1}{9a - 7}$ d) $f(-15) = 241$
       e) $g(3) = 3$ f) $h\left(\frac{1}{3}\right)$ is not a real number

7)   a) $F(3\pi) = -5\pi$ b) $F(h - 4\pi) = -2h + 9\pi$

8)   a) $g(-1) = 2$ b) $x = -1$ c) $g\left(\frac{1}{2}\right) = 5$

The scale on each axis is 1 unit per hash mark. Graph for part (a) is the line with the positive slope (rising) and the graph for part (b) is the line with the negative slope (falling).

9)

10)   164.98 centimeters

11) $6y^6 - 12y^5 + 27y^4 - 21y^3 - 18y^2$

12) $12a^2 - 11a - 36$

13) $90x^3 - 135x^2 + 50x$

14) $12n^3 + 5n^2 + 5n + 6$

15) $24x^3 - 32x^2 + 28x - 15$

16) a) $36x^2 - \dfrac{1}{4}$ b) $144x^2 - 120x + 25$

17) $8x^3 + 34x^2 + 5x - 12$

18) Area $= 4x^2 + 11x - 41$

19) Volume $= 2x^3 + 31x^2 + 110x - 63$

20) $x = \dfrac{48}{7}$

21) $x = -\dfrac{5}{2}$ 22) $x = 130$

23) $x = 7$ 24) $x = \dfrac{5}{2}$

25) $t = -15$ 26) no solution

27) $4000 was invested in the bond.

28) 40 mL of the 6% solution was added.

29) The car had been following the truck for $\dfrac{13}{14}$ hours or approximately 55.7 minutes.

30) Distance is 2 miles.

31) Helen's time alone is 2/3 hour or 40 minutes.

32) $x = \dfrac{5}{2}, -\dfrac{2}{3}$ 33) $x = \dfrac{5}{2} + \dfrac{\sqrt{13}}{2}, \dfrac{5}{2} - \dfrac{\sqrt{13}}{2}$

34) $x = \dfrac{1}{7}$ only   35) $x = -\dfrac{5}{6} + \dfrac{\sqrt{13}}{6}, -\dfrac{5}{6} - \dfrac{\sqrt{13}}{6}$

36) 2 feet wide walkway   37) 5 feet

38) newer worker: about 11.1 hours to clean the building alone