MAT150 College Algebra – Solutions to Class Handouts

Sections 1.1 – 1.2

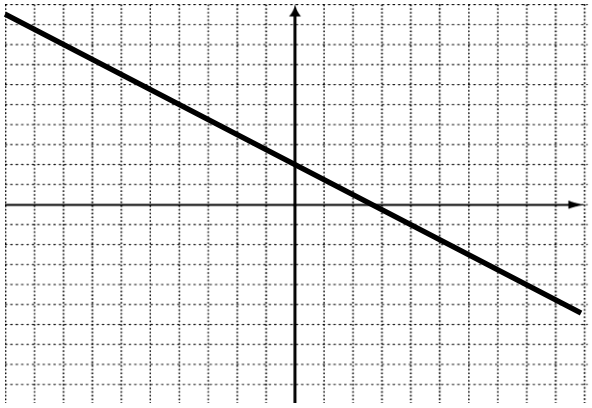
1. a. yes b. yes c. NO d. yes e. yes f. yes
2. a. -9 b. 3 c. f(2) = -5 d. $AROC = \frac{7-(-5)}{4-(-2)} = 2$
3. Input variable: Speed (mph)
   Output variable: Stopping Distance (feet)
   A car travelling at 30mph can come to a complete stop in 55 feet.
4. a. 11 b. 0 c. -2 d. $\frac{11-35}{4-1} = -8$ b. $AROC = \frac{5-6}{2-(-1)} = -\frac{1}{3}$
5. a. f(-2)=1 b. $x = \pm\sqrt{5}$ c. g(a) = 2 – 3a d. $f(x+h) = 5 - x^2 - 2xh - h^2$

   d. $AROC = \frac{5-1}{0-(-2)} = 2$ e. $AROC = \frac{2-3b\ -\ 2-3a}{b-a} = \frac{-3(b-a)}{b-a} = -3$

   f. $AROC = \frac{g(x+h)-g(x)}{(x+h)-x} = \frac{2-3x-3h\ -\ 2-3x}{h} = \frac{-3h}{h} = -3$

Sections 1.3 – 1.4

1.



x – intercept: (8/3, 0)

vertical intercept: (0, 2)

Slope: -3/4

Two additional points on the line:

(4, -1) (8, -4) (-4, 5) (-8, 8)

2. y=1200x – 300
3. y = -5x + 20
4. a. Showing that the AROC is the same using three separate pairs is sufficient:

$$AROC = \frac{19-7}{-2-1} = -4,\ AROC = \frac{-81-(-21)}{23-8} = -4,\ AROC = \frac{-133-19}{36-(-2)} = -4$$

   b. y = -4x + 11
5. $A(n) = \frac{4}{3}n + \frac{19}{3}$
6. a. Time (years) b. Height (feet) c. $H = \frac{1}{3}t + 5$

   d. The tree grows at a rate of 1/3 foot (4 inches) per year.
   e. The tree was 5 feet tall when it was planted

7. In 1960 there were 50 cats. Since then the number of cats has been increasing by 4 cats per year.

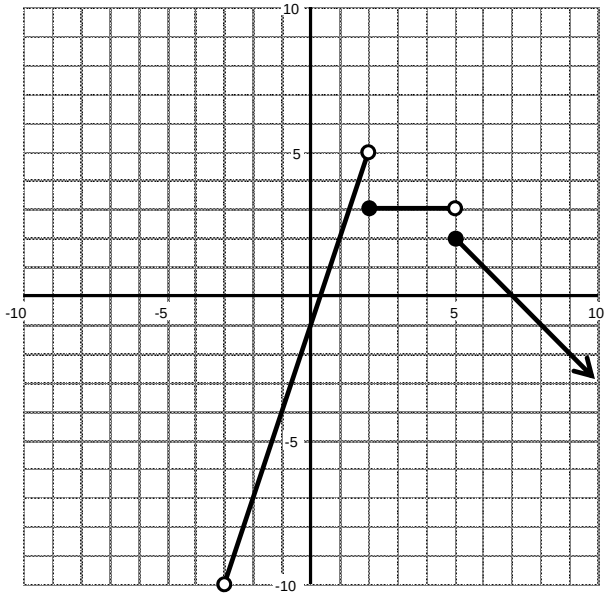
Sections 2.1 – 2.4

1. a. 5 b. 15 c. 15 d. 9 e. 2 f. 3
2. a. 6 b. -7 c. 2 d. -3 e. 3 f. 0
3. a. $f(g(x)) = x^{-9}$ b. $g(f(x)) = x^{-9}$ c. Not inverses. $f(g(x)) \neq x$ and $g(f(x)) \neq x$
4. a. $-p(x) = -x^2 - 2x - 3$ b. $p(-x) = x^2 - 2x + 3$
   c. $p(r(x)) = x^2 - 12x + 38$ d. $r(p(x)) = -x^2 - 2x + 2$
   e. $r(p(x)) = r(2) = 3$ f. $x = 5 - r$ or $r^{-1}(x) = 5 - x$

Sections 2.3 – 2.6

1. a. Decreasing b. g(x) c. f(x)
2. $x = \frac{1+\sqrt{41}}{2} \approx 3.702$ and $x = \frac{1-\sqrt{41}}{2} \approx -2.702$
3. a. Increasing
   b. It costs \$200 to produce 540 gallons of ice cream.
   c. It costs \$330 to produce 870 gallons of ice cream.

4. a. *f(-10)*= DNE b. *f(2)*= 3 c. *f(5)*= 2 d. *f(10)*= -3
   e. Sketch the graph.



5. a. 0<x<2 and x>4 b. 0<x<1 and x>3 c. (1, 9) and (3, 9)