

Homework #18

10/5/4

Lesson 18.1:

1) $f(x) = x^2 - 12x + 39$, $\frac{f(8) - f(5)}{8 - 5} = \frac{7 - 4}{8 - 5} = 1$

2) $\frac{f(6) - f(2)}{6 - 2} = \frac{4 - 8}{6 - 2} = \frac{-4}{4} = -1$

3) a) i) $\frac{95.9 - 0.0}{2 - 0} = 47.95 \frac{\text{ft}}{\text{sec}} \rightarrow 47.95 \frac{\text{ft}}{\text{sec}} \left(\frac{1 \text{ mi}}{5280 \text{ ft}} \right) \left(\frac{3600 \text{ sec}}{1 \text{ hr}} \right) = 32.69 \frac{\text{mi}}{\text{hr}}$

ii) $\frac{365.7 - 95.9}{4 - 2} = 134.9 \frac{\text{ft}}{\text{sec}} \rightarrow 134.9 \frac{\text{ft}}{\text{sec}} \left(\frac{1 \text{ mi}}{5280 \text{ ft}} \right) \left(\frac{3600 \text{ sec}}{1 \text{ hr}} \right) = 91.98 \frac{\text{mi}}{\text{hr}}$

iii) $\frac{782.6 - 365.7}{6 - 4} = 208.45 \frac{\text{ft}}{\text{sec}} \rightarrow 208.45 \frac{\text{ft}}{\text{sec}} \left(\frac{1 \text{ mi}}{5280 \text{ ft}} \right) \left(\frac{3600 \text{ sec}}{1 \text{ hr}} \right) = 142.13 \frac{\text{mi}}{\text{hr}}$

iv) $\frac{1320.0 - 782.6}{8 - 6} = 268.7 \frac{\text{ft}}{\text{sec}} \rightarrow 268.7 \frac{\text{ft}}{\text{sec}} \left(\frac{1 \text{ mi}}{5280 \text{ ft}} \right) \left(\frac{3600 \text{ sec}}{1 \text{ hr}} \right) = 183.20 \frac{\text{mi}}{\text{hr}}$

b) They are the car's velocity

Lesson 18.2:

4) a)

x	y = 2 ^x
0	1
2	4
4	16
6	64
8	256

i) $m(1) = \frac{4 - 1}{2 - 0} = 1.5$

ii) $m(3) = \frac{16 - 4}{4 - 2} = 6$

iii) $m(5) = \frac{64 - 16}{6 - 4} = 24$

iv) $m(7) = \frac{256 - 64}{8 - 6} = 96$

c)

x	m
1	1.5
3	6
5	24
7	96

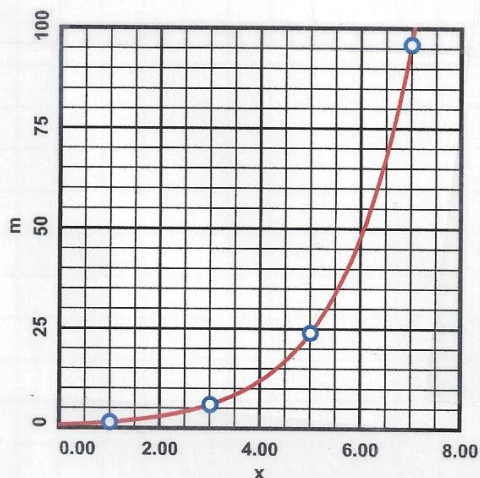
d) see next page

e) $m = 0.75(2)^x$

$r^2 = 1$ means the points are on an exponential function exactly

Homework #1 B

d, f)



Lesson 18.3:

20F4

5) a) $\frac{3 \text{ mi}}{1/8 \text{ hr}} = 24 \frac{\text{mi}}{\text{hr}}$

b) $\frac{1}{8} \text{ hr} \left(\frac{60 \text{ min}}{1 \text{ hr}} \right) = 7.5 \text{ min}$

c) $\frac{6 \text{ mi}}{3/8 \text{ hr}} = 16 \frac{\text{mi}}{\text{hr}}$

d) $\left(1 \frac{3}{8} \text{ hr} \right) \left(\frac{60 \text{ min}}{1 \text{ hr}} \right) = 82.5 \text{ min}$

e) $\frac{0-6}{2-1 \frac{3}{4}} = -24 \frac{\text{mi}}{\text{hr}}$

Negative means she is going in the opposite direction (on the way back home).

6) $p \equiv$ percent of adult smokers
 $y \equiv$ year

a) $\frac{\Delta p}{\Delta y} = \frac{11.5 - 40.0}{2021 - 1965} = -0.5089285714 \frac{\%}{y}$

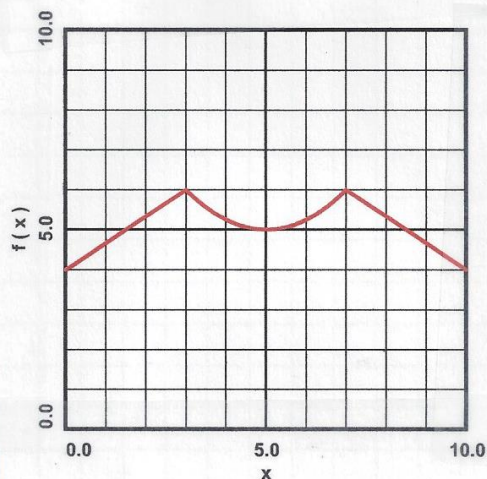
b) $p = -0.5089285714 y + b$, $40 = -0.5089285714(1965) + b$,
 $b = 1040.044643$

$p = -0.5089285714 y + 1040.044643$

i) $p(2030) = 6.9\%$ ii) $5 = p(y) \Rightarrow y = 2034$

Lesson 18.4:

7)

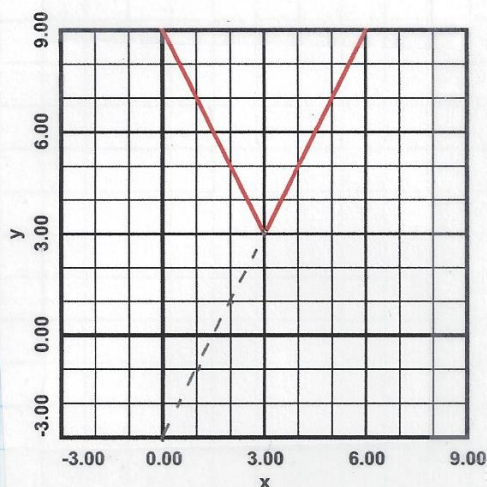


Homework #1B

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Lesson 1B.6:

11)



12)

$$y = \begin{cases} -2x + 9, & x \leq 3 \\ 2x - 3, & x > 3 \end{cases}$$

$$13) \quad y - 1 = 3 |x - 3|$$

$$x \leq 3: \quad y - 1 = -3(x - 3)$$

$$y - 1 = -3x + 9$$

$$y = -3x + 10$$

$$x > 3: \quad y - 1 = 3(x - 3)$$

$$y - 1 = 3x - 9$$

$$y = 3x - 8$$

$$y = \begin{cases} -3x + 10, & x \leq 3 \\ 3x - 8, & x > 3 \end{cases}$$

14) vertex is at $x = 5$.

$$y = \begin{cases} -4(x) + 17 = -3 \\ 4(x) - 23 = -3 \end{cases} \Rightarrow$$

$$y + 3 = 4 |x - 5|$$