Name Key Date

Math 8A

Modeling with Linear Functions
Classwork (Analyzing Graphs)

DO NOW: Given the points $(-3,-16)$ and $(2,9)$, determine the equation of the line. Then, determine the value of a, to make the point $(a,-6)$ lie on the line.

$(-3,-16)$ $(2,9)$
x_1 y_1 x_2 y_2

$m = \frac{y_2-y_1}{x_2-x_1}$ $m = \frac{9-(-16)}{2-(-3)}$ $m = \frac{9+16}{2+3}$ $m = \frac{25}{5}$ $m = 5$

$(a,-6)$ $(2,9)$
x_1 y_1 x_2 y_2

$m = \frac{y_2-y_1}{x_2-x_1}$ $5 = \frac{9-(-6)}{2-a}$ $5 = \frac{9+16}{2-a}$ $5 = \frac{25}{2-a}$

$5(2-a) = 25$
$10-5a = 25$
$-10 \quad -10$
$-5a = 15$
$-5 \quad -5$
$a = -3$

Guided Practice:

Exercise 1- The cost of belonging to a gym can be modeled by $C(m) = 50m + 79.50$, where $C(m)$ is the total cost for m months of membership.

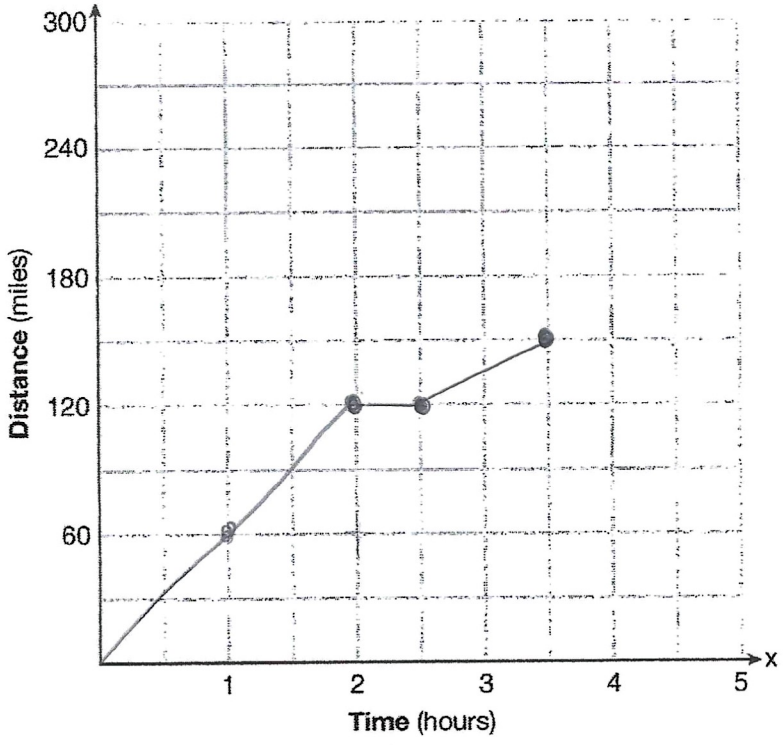
State the meaning of the slope and y-intercept of this function with respect to the costs associated with the gym membership.

Slope = 50, The gym membership costs $50 per month to attend

y-int = 79.50, There is a $79.50 fee to join the gym

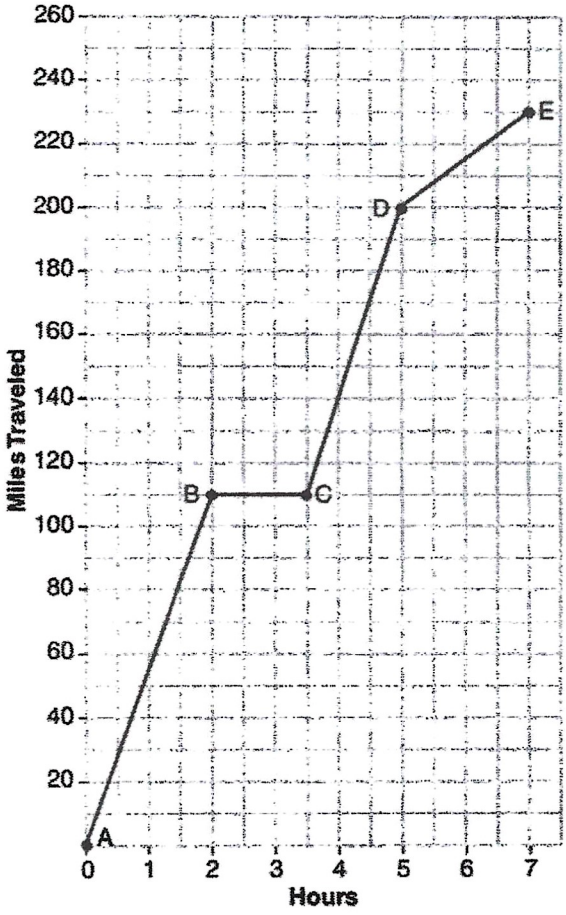
Exercise 2- A driver leaves home for a business trip and drives at a constant speed of 60 miles per hour for 2 hours. Her car gets a flat tire, and she spends 30 minutes changing the tire. She resumes driving and drives at 30 miles per hour for the remaining one hour until she reaches her destination.

On the set of axes below, draw a graph that models the driver's distance from home.



1 box = 30 min

Exercise 3- The graph below models Craig's trip to visit his friend in another state. In the course of his travels, he encountered both highway and city driving.



Based on the graph, during which interval did Craig most likely drive in the city? Explain your reasoning.

$\overline{AB} = \frac{110}{2} = 55$ $\overline{CD} = \frac{90}{1.5} = 60$

$\overline{BC} = 0$ $\overline{DE} = \frac{30}{2} = 15$

From D to E, 15 miles per hour is an appropriate speed for city driving b/c there is always so much traffic

Explain what might have happened in the interval between B and C.

Craig stopped to go to the bathroom

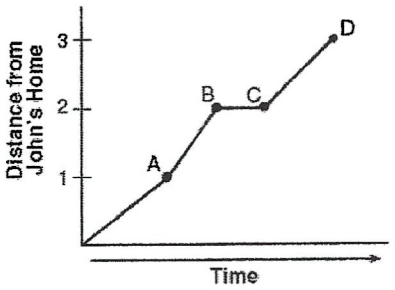
Determine Craig's average speed, to the nearest tenth of a mile per hour, for his entire trip

$\frac{230}{7} = 32.857142\overline{86}\ldots$

32.9 mph

HOMEWORK:

1. John left his home and walked 3 blocks to his school, as shown in the accompanying graph. What is one possible interpretation of the section of the graph from point *B* to point *C*?



(1) John arrived at school and stayed throughout the day.

(2) John waited before crossing a busy street.

(3) John returned home to get his mathematics homework.

(4) John reached the top of a hill and began walking on level ground.

2. The amount Mike gets paid weekly can be represented by the expression $2.50a + 290$, where a is the number of cell phone accessories he sells that week. What is the constant term in this expression and what does it represent?

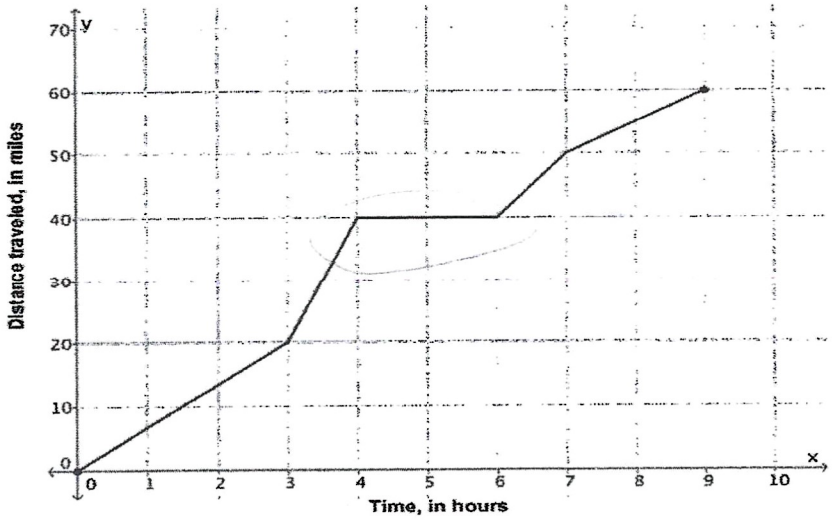
(1) 2.50a, the amount he is guaranteed to be paid each week

(2) 2.50a, the amount he earns when he sells a accessories

(3) 290, the amount he is guaranteed to be paid each week

(4) 290, the amount he earns when he sells a accessories

3. Sarah went on a bike ride. The graph below shows the distance, y, in miles, that she had traveled after biking for x hours.



State the domain and range of the function shown in the graph.

Domain: $0 \leq x \leq 9$ or $[0,9]$ Range: $0 \leq y \leq 60$ or $[0,60]$

Explain what may have happened between hour 4 and 6.

She stopped to go to the bathroom

State the interval of time during which Sarah was riding the fastest. Explain your reasoning.

$0 \leq x \leq 3$: $m = \frac{20}{3} = 6\frac{2}{3}$

$3 \leq x \leq 4$: $m = \frac{20}{1} = 20$

$4 \leq x \leq 6$: $m = 0$

$6 \leq x \leq 7$: $m = \frac{10}{1} = 10$

$7 \leq x \leq 9$: $m = \frac{10}{2} = 5$

Sarah travels the fastest between $3 \leq x \leq 4$ B/c the slope is the greatest