

Name: _____ Hour: _____

Lesson 5 - Compare Properties of Functions

Objective: We will compare properties of functions.

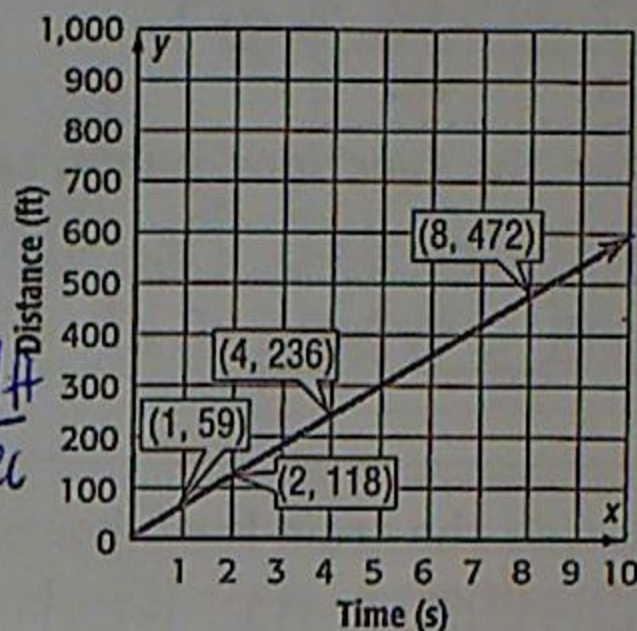
Example 1: A zebra's main predator is a lion. Lions can run at a speed of 53 feet per second over short distances. The graph shows the speed of a zebra. Compare their speeds.

- Find the rate of change for both situations.
- Compare.

Lion - $\frac{53 \text{ ft}}{1 \text{ sec}}$

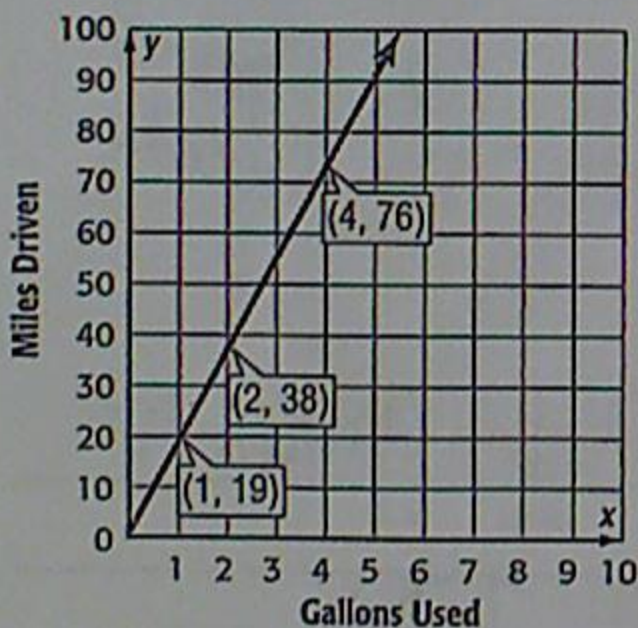
Zebra - $(2, 118)$
 $(1, 59)$

$$\frac{118 - 59}{2 - 1} = \frac{59}{1 \text{ sec}}$$



The Zebra runs faster b/c $59 > 53$.

Example 2: A certain car has a gas mileage of 22 miles per gallon. The gas mileage of a certain sport utility vehicle is represented by the function shown. Compare their gas mileage.



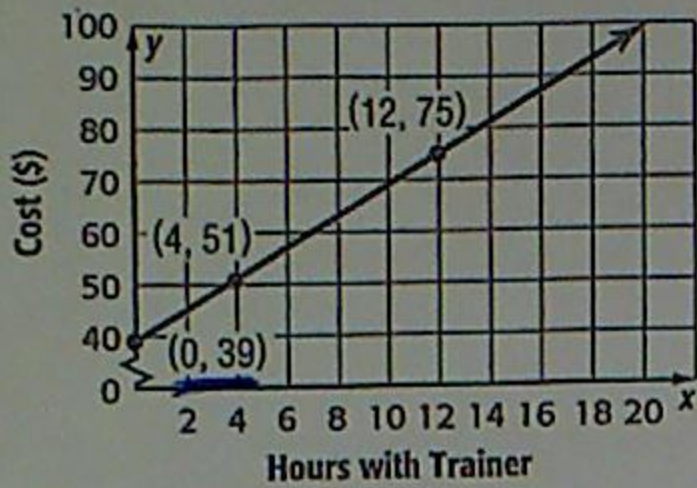
Car - $\frac{22 \text{ mi}}{\text{gal}}$

SUV - $(2, 38)$
 $(1, 19)$

$$\frac{\Delta y}{\Delta x} = \frac{38 - 19}{2 - 1} = \frac{19 \text{ mi}}{1 \text{ gal}}$$

The car gets better gas mileage b/c $22 > 19$.

Example 5: Mandy and Sarah each have a membership to the gym. Mandy's membership is represented by the function $y = 3x + 29$, where x represents the hours with a trainer and y represents the cost. The cost of Sarah's membership is shown in the graph.



Sarah's
 $y\text{-int} = 39$
 rate of change = $\frac{(12, 75) - (4, 51)}{12 - 4} = \frac{24}{8} = \3 per hour

Mandy's
 $y\text{-int} = 29$
 rate of change = $\$3 \text{ per hr}$

a. Compare the y-intercepts and rates of change.

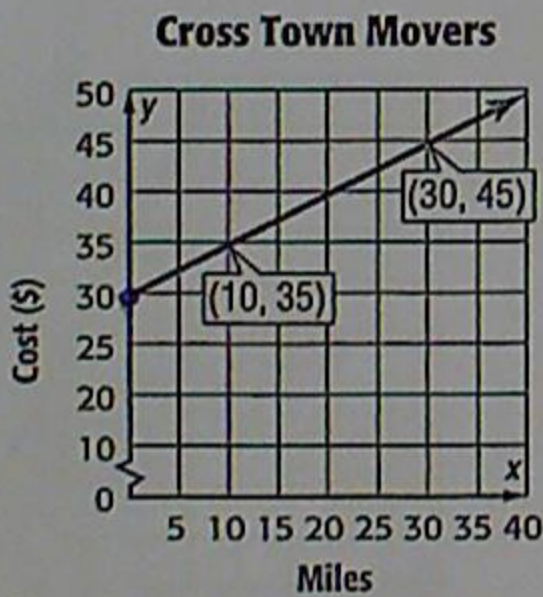
Sarah has a greater initial cost b/c $39 > 29$.
 Sarah & Mandy pay the same amount per hour.

b. What will be the total cost for Mandy and Sarah if they have 4 hours with a trainer?

Mandy's $y = 3x + 29$
 $= 3(4) + 29$
 $= 41$

Sarah - $\$51$

Example 6: Lorena's mother needs to rent a truck to move some furniture. The cost to rent a truck from two different companies is shown in the table and graph. Which company should she use to rent the truck for 40 miles?



Slope = $\frac{(30, 45) - (10, 35)}{30 - 10} = \frac{10}{20} = \frac{1}{2}$
 $y\text{-int} = 30$

Ron's Rentals	
Miles	Cost (\$)
10	25
20	50
30	75
40	100

$\$100$

$y = \frac{1}{2}x + 30$

$= \frac{1}{2}(40) + 30$
 $= 20 + 30$
 $= \$50$

Cross Town Movers b/c $50 < 100$.