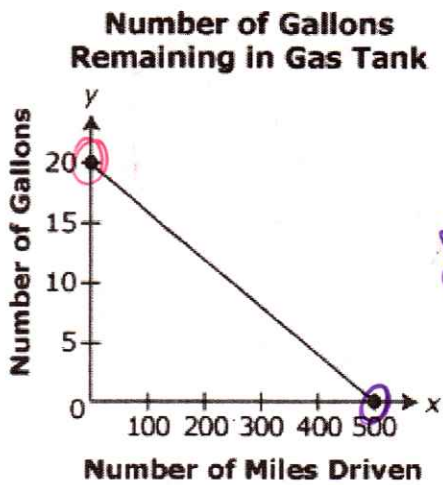


1. A car owner recorded the number of gallons of gas remaining in the car's gas tank after driving a number of miles. Use the graph below to answer the following questions.



a. What does x-intercept represent on the graph?

The number of miles driven when you run out of gas.
 (500, 0) → gal of gas
 ← miles driven

b. What does the y-intercept represent on the graph?

The # of gallons of you start with.
 (0, 20) → gal of gas
 ← miles driven

c. What does the point (200, 12) represent on the graph?

After you've driven 200 miles, you have 12 gallons of gas left.

2. The graph below shows the relationship between the number of mid-sized cars in a car dealer's inventory and the number of days after the start of a sale.



a. What does x-intercept represent on the graph?

The # of days it takes to sell all the cars.
 (15, 0) → # of cars left
 ← days of sale

b. What does the y-intercept represent on the graph?

How many cars you started with.
 (0, 150) → # of cars left
 ← days after sale

c. What does the point (10, 50) represent on the graph? Is the point a solution of the graph?

After 10 days, there are 50 cars left.

d. What does the point (5, 125) represent on the graph? Is the point a solution of the graph?

not a solution; point not on line

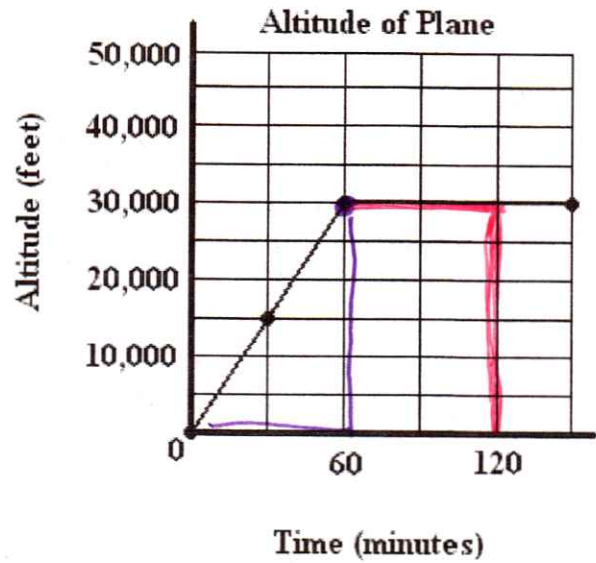
3. The graph shows the altitude of a plane.

- a. Find the plane's rate of change during the first hour.

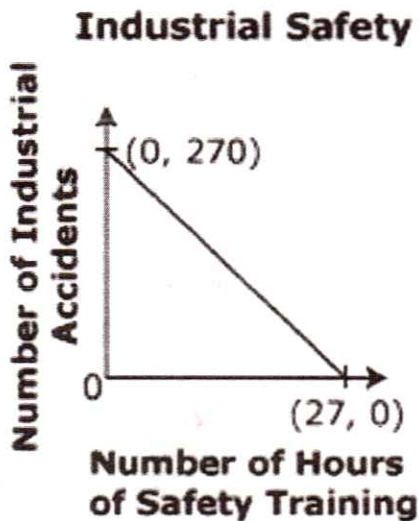
$$\frac{\Delta y}{\Delta x} = \frac{30000}{60} = 500 \text{ feet per min}$$

- b. Find the plane's rate of change during the second hour.

$$\frac{\Delta y}{\Delta x} \rightarrow \frac{0}{60} \rightarrow 0$$



4. An industrial-safety study finds there is a relationship between the number of industrial accidents and the number of hours of safety training for employees. This relationship is shown in the graph below.



- a. Find the rate of change.

$$\frac{270}{27} \rightarrow 10$$

- b. Explain what it represents.

You should expect 10 fewer accidents for every hour of training.

11-1-19 - Comparing Linear Functions

Linear Functions can come in many forms:

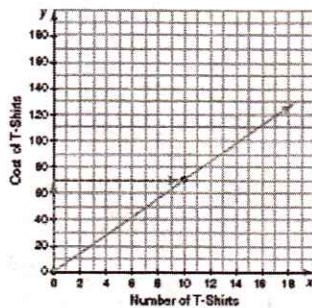
Context:

The basketball team won the championship. They are selling special championship T-shirts for a cost of \$7 each.

rate of change

y-intercept = 0

Graph:



$\frac{\text{rise}}{\text{run}} = \frac{\$7}{1 \text{ T-shirt}}$

Table:

Number of T-shirts	Cost in Dollars
0	0
1	7
2	14
3	21
4	28
5	35

rate of change = $\frac{7-0}{1-0} = \frac{\$7}{1 \text{ T-shirt}}$

Equation:

Let y represent: total cost of T-shirts
Let x represent: number of T-shirts

$y = 7x$

$y = 7x + 0$

Rate of change y-intercept

Now that you have studied linear functions and their characteristics for over two weeks, you need to be able to compare and answer questions in whatever form is given to you. The best way to develop your comparing skills is just to practice; there is not actual lesson - just practice problems for you to try.

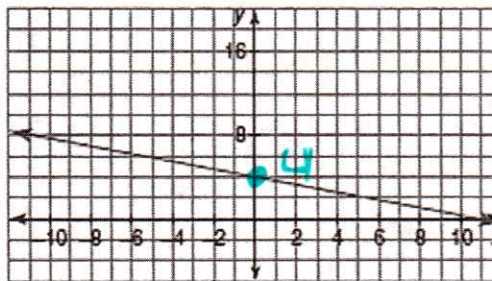
Practice 1: Which function has the biggest y-intercept?

Function A:

x	y
0	6
1	9
2	12
3	15

$b = 6$

Function B:



$b = 4$

Function C:

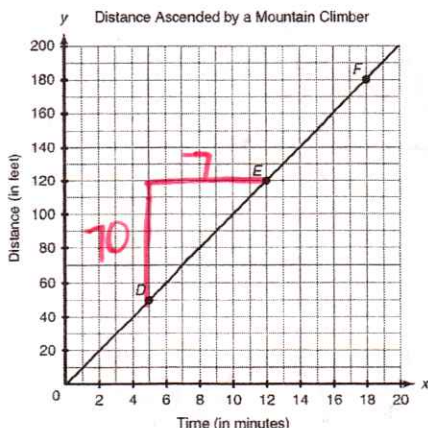
$y = -10x + 2.5$

$b = 2.5$

***largest b value**

Practice 2: Which function has the greatest rate of change?

Function A:



$\frac{70}{7} \rightarrow 10$

Function B:

Number of Minutes on an Exercise Bike	Total Number of Calories Burned
15	180
30	360
45	540
60	720

$\frac{180}{15} \rightarrow 12$

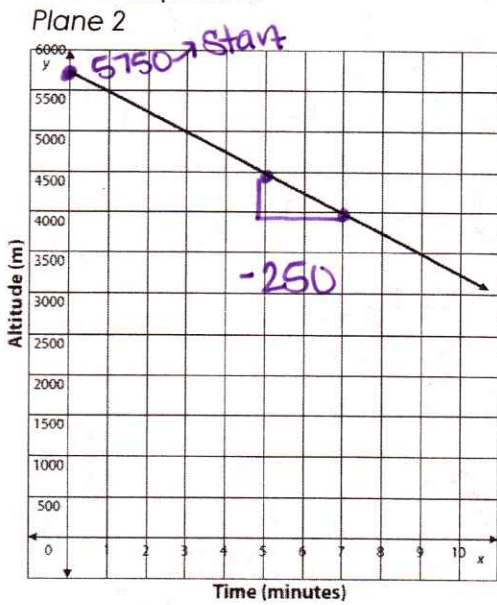
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Function C:

$$\begin{aligned} 30x + 2y &= -24 \\ -30x & \quad -30x \\ \hline 2y &= -30x - 24 \\ \frac{2y}{2} &= \frac{-30x}{2} - \frac{24}{2} \\ y &= -15x - 12 \end{aligned}$$

*** -15 (ignore neg) has the greatest rate of change**

Practice 3: Two airplanes are in flight. The function $f(x) = 400x + 1200$ represents the altitude, $f(x)$, of Plane 1 after x minutes. The graph below represents the altitude of the second airplane.



Compare the starting altitudes of the two planes.

plane 1: 1200 feet

plane 2: 5750 feet

plane 2 starts higher

Compare the rate of change of the two planes.

plane 1: 400 (rising)

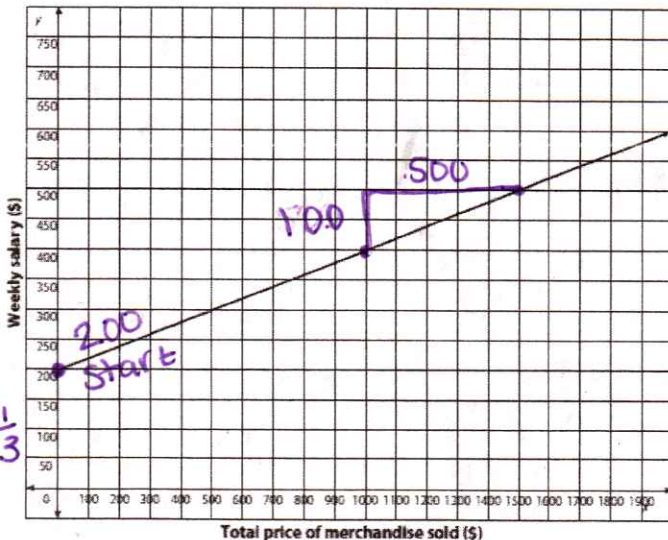
plane 2: -250 (landing)

ignore neg sign

plane 1 is changing faster

Practice 4: Your employer has offered two pay scales for you to choose from. The first option is to receive a base salary of $\$250$ a week plus 15% of the price of any merchandise you sell. The second option is represented in the graph below.

Option 2



a. Create an equation to represent the first option for one week's worth of pay.

$$y = .15x + 250$$

b. Create an equation to represent the second option for one week's worth of pay.

$$y = .20x + 200$$

c. Which option has a higher base salary? Explain how you know.

b value

The 1st option has a higher base salary at \$250 compared to \$200

d. Which option has a higher rate for selling merchandise? Explain how you know.

ROC

Option 2 b/c .2 is better than .15.