

## Functions + Slope

1. [B] Because Jessie's ride is 5 minutes more than Robert's bus ride, you took at which graph has Jessie starting at 5. You can immediately cross off A + B. Next, which graph has a slope of  $2/3$ ? B is up 2 and over 3. The slope for C is  $3/2$ , which is a stump.

11. Since  $x = \#$  movies per month, plug 1 in to the equation

$$2(1) + 12 = 14 + 12 = \boxed{16} \checkmark$$

14. [C]  $50x = 40$  ← plug in 40 + not 30 because you want a profit of \$10  
 ↑  
 # candybars

$$\frac{50x = 40}{50 \quad 50}$$

$$\boxed{x = .80}$$

17. [D] - key words are "average" and "rate of change"

Step 1: Find the rate of change between each  $y$  value (weight). Notice it's not constant.

8	.04	}	.03
9	.07		
10	.14	}	.07
11	.25		
12	.49	}	.24

(2) Now, to get the average, add up the rates of change + divide by 4  
 $.03 + .07 + .11 + .24 = .45$   
 $.45 \div 4 = \boxed{.1125 \text{ D}}$

18. C You're given an equation and a table and asked to compare the y-intercepts.

$f(x) = 3x + 5$  ← y-intercept

x	y
-7	2
-5	3
-3	4
-1	5
0	<span style="border: 1px solid black; border-radius: 50%; padding: 2px;">?</span>
1	6

\* The y-intercept in a table is the y value when  $x = 0$ , so extend the table to include 0 for x

\* Notice the x-values go by 2 - now make the table with them increasing by 1

x	y
-7	2
-6	2.5
-5	3
-4	3.5
-3	4
-2	4.5
-1	5
0	<span style="border: 1px solid black; border-radius: 50%; padding: 2px;">5.5</span>

The y values increase

$5.5 - 5 =$  .5 - 0

19. Remember, when setting up equations, anything 'initial', 'original' is the y-intercept - it's the starting point.

$$\begin{array}{l} \text{Company Y} \\ \text{Company Z} \end{array} \quad \begin{array}{l} = 10x + 10 \\ = 20 + 0 \end{array}$$

The question asks what the difference in cost is between Y + Z, so subtract.

$$\begin{array}{r} = 10x + 10 \\ - = 20x - 0 \\ \hline \text{B } = -10x + 10 \end{array}$$

20. **D** • Look at Method 1 - find the rate of change - it's not constant or exponential  
• Look at method 2 - the y-values increase by  $\times 2$  each time, which when the rate of change is multiplied or divided, it means it's an exponential rate of change

21. **B** The question is asking you to compare slopes, and say which one has a smaller slope.

① Find the slope of the graphed line by using rise from any point up 1 over to the run right 3 =  $\frac{1}{3}$ .

② Plot the x-y intercepts to make the other line y-int = -2 + x-int =  $\frac{4}{3}$  (1.3) - slope of this line is about 2, so  $\frac{1}{3}$  is answer

22. The question is asking what the meaning of the slope is so only focus on  $-0.0018$ .
- Notice the answer choices don't have  $-0.0018$  anywhere, but number choices that are similar, but with the decimal moved.
  - Notice that the last number in each choice is 1,000 & it says 'increases by 1000'
  - Multiply  $-0.0018$  by 1,000 = 1.8 - answer choice **D**

23. **A** Since you are given two pairs of points, you have 2 options.

(1) use the slope formula  $\frac{y_2 - y_1}{x_2 - x_1}$  to find the slope of the line.

(2) Graph the two points and count rise to get the slope. run

$J(2, 4)$      $L(6, 8)$      $\frac{8-4}{6-2} = \frac{4}{4} = 1$      $\forall x+2$   
 $x_1 \quad y_1$      $x_2 \quad y_2$

- Since the question asks for the equation of a line that is PERPENDICULAR, that means the slope will have an opposite reciprocal slope. This means the slope will be  $-1$  and the line will point in the other direction which will give you a positive y-intercept.

20. **C** Slope is  $\frac{\text{rise}}{\text{run}}$  or  $\frac{x}{y}$ , so take any x value in the table (minutes) and put it over the corresponding y-value & simplify.

$\frac{20}{25} = \frac{4}{5}$   $\frac{\text{minutes}}{\text{miles}}$

3. (A) First find the rate of change - how much does the cost (C) change as the number of toppings change? It changes by \$1.50 each time, which means that's the slope. Since the initial value is \$12, that's the y-int.

$y = 1.5n + 12$  - \*now, you may think the answer is B, BUT you've got to deduct 1 each time because 1 topping is 12 and every additional topping is \$1.50.

If you check, you'll notice:

$$\begin{aligned} 12 + 1.5(1-1) &\rightarrow 12 + 1.5(0) \rightarrow 12 \\ 12 + 1.5(2-1) &\rightarrow 12 + 1.5 \rightarrow 13.50 \\ 12 + 1.5(3-1) &\rightarrow 12 + 3.00 \rightarrow 15 \\ 12 + 1.5(4-1) &\rightarrow 12 + 4.5 \rightarrow 16.50 \end{aligned}$$