



Math Virtual Learning

**Grade 8**

**Scatter Plots: Relationships**

April 29, 2020



Math 8

Lesson: April 29, 2020

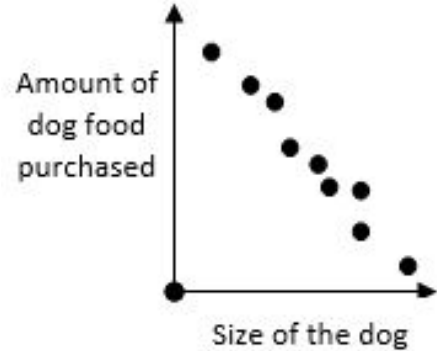
**Objective/Learning Target:**

I can write an equation to model the relationship in a scatter plot (trend line).

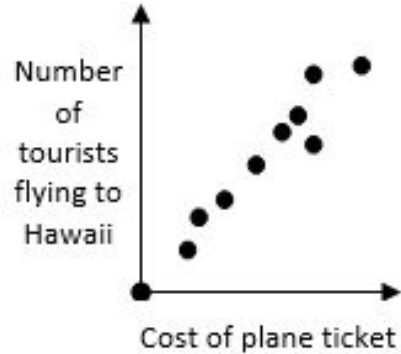
# Warm-Up:

Which graph correctly represents the correlation of its given situation?

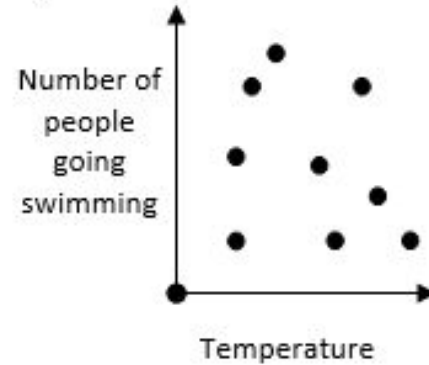
A)



B)



C)



D)

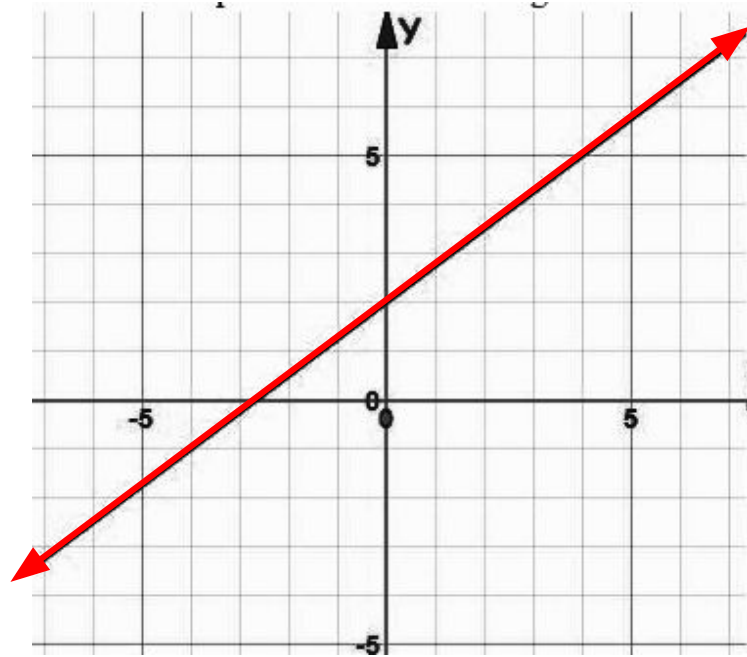


**Solution: D** (As the number of customers increases, the amount of clothing sold increases)

# Quick Review:

Find the slope and y-intercept of the line below.

Then write an equation in slope-intercept form:  $y = mx + b$



Slope \_\_\_\_\_

Y-intercept \_\_\_\_\_

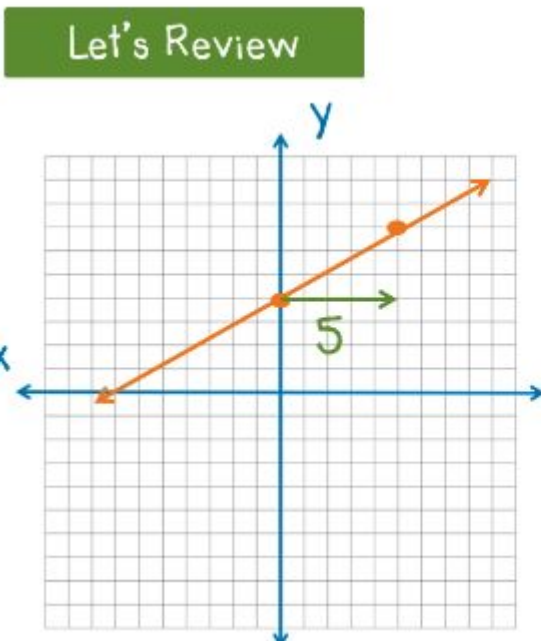
Equation of line: \_\_\_\_\_

**Solution:** slope:  $\frac{3}{4}$  y-intercept: 2 Equation:  $y = \frac{3}{4}x + 2$

# Video: Writing an Equation for Line of Best Fit

Click [the link](#) to watch the video.

Take notes on a piece of paper as you watch this video.

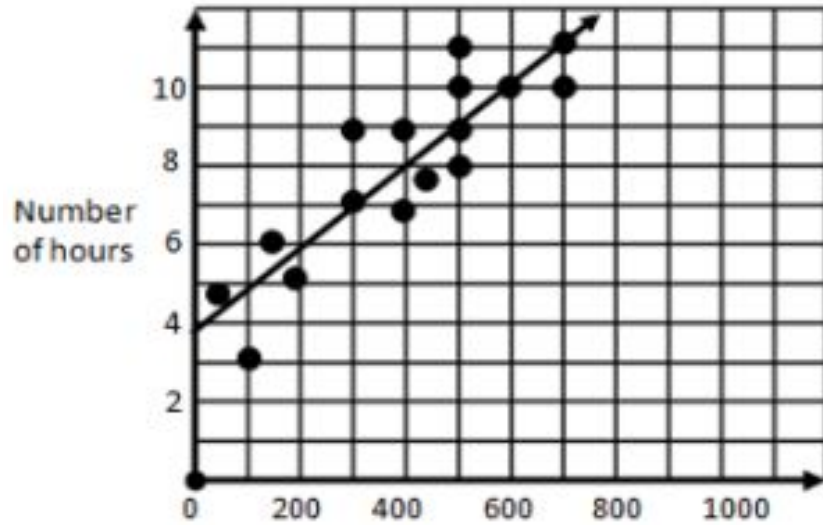


Slope is:  
ratio of change in y  
to change in x  
Rise to Run  
 $\frac{\text{Rise}}{\text{Run}}$   
Rate of Change  
Steepness  
Speed

# Try This: Choosing Two Points on the Trend Line

*Answer shown below*

The graph below shows the relationship between the distance in miles a delivery truck traveled and the number of hours each delivery took.



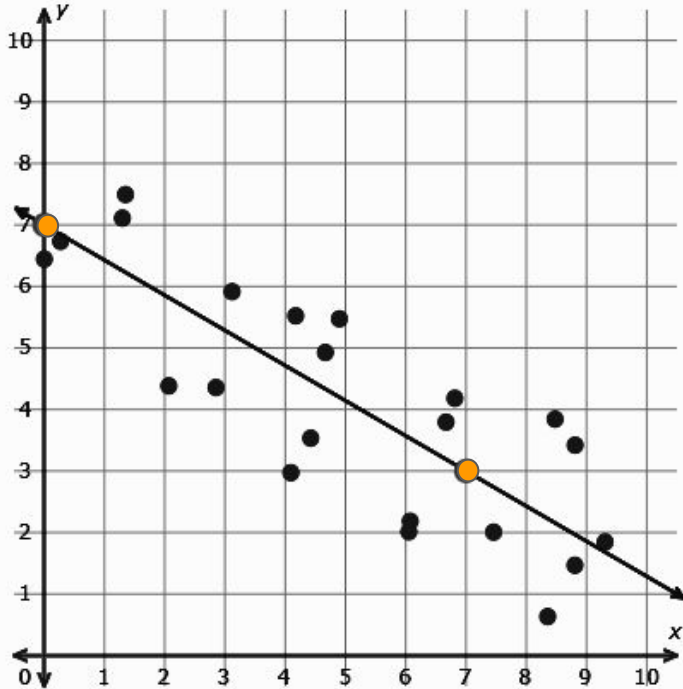
Which of the two given points would be the best to use to calculate the line of best fit?

- A) (500, 11) and (700, 11)
- B) (300, 9) and (400, 7)
- C) (400, 9) and (500, 11)
- D) (300, 7) and (600, 10)

*Notice the other answers do not have points that are directly on the trend line.*

**Answer: D**

# How to: Write the Equation for a Trend Line



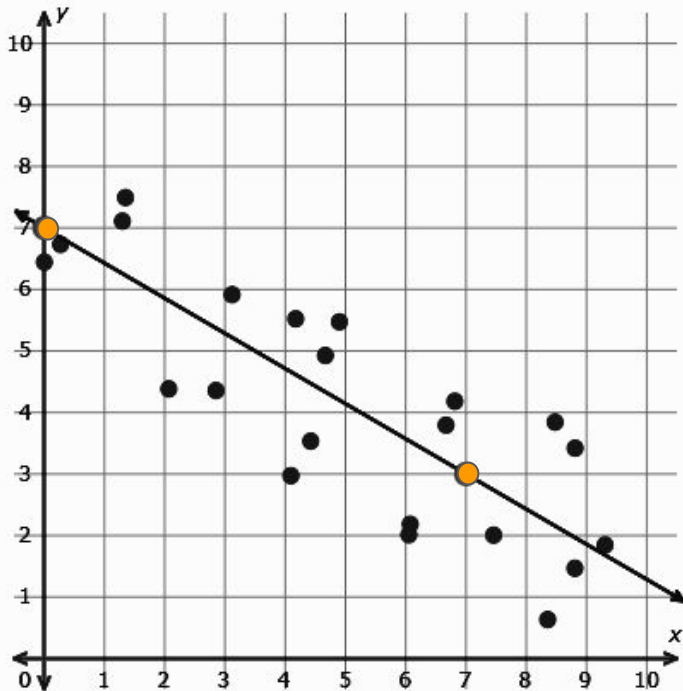
1. Create a line that goes through the graph with the same number of points above and below the line.
2. Find two points on the line.  
**(0,7)**      **(7,3)**
3. Use those two points to find the slope of the line using the slope formula.

$(X_1, Y_1)$        $(X_2, Y_2)$

$$m = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1} \longrightarrow \frac{7 - 3}{0 - 7} = \boxed{\frac{4}{-7}}$$

# How to cont'd:

## Write the Equation for a Trend Line



4. Use the slope-intercept form equation to find the y-intercept of the line.

*I chose to use the ordered pair (7,3) to find the value of b for our equation. Identify the x and y values to plug into the equation. The m value is the slope that was found on step 3.*

(x,y)

$$x = 7$$

$$y = 3$$

5. Write the equation.

$$y = -\frac{4}{7}x + 7$$

$$y = mx + b$$

$$3 = \frac{4}{-7}(7) + b$$

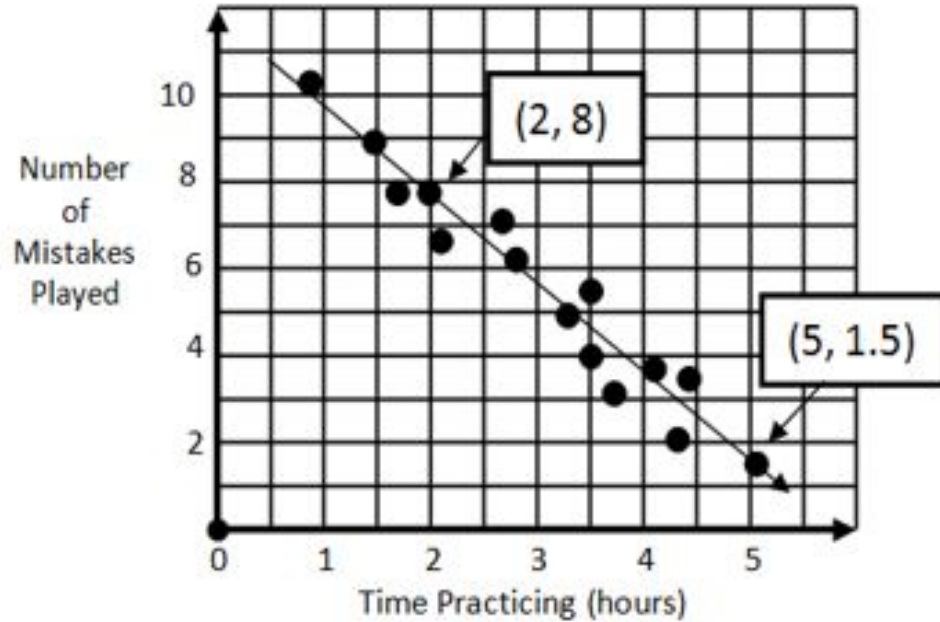
$$3 = -4 + b$$

$$\begin{array}{r} +4 \\ \hline \end{array} \quad \begin{array}{r} +4 \\ \hline \end{array}$$

$$7 = b$$



**Practice 1:** Chang wants to know if he is improving his skill on the cello. He created a scatter plot and drew a line of best fit.



If Chang uses the points  $(2, 8)$  and  $(5, 1.5)$  for his line, which equation would best represent the line of best fit?

- A)  $Y = -2.17x + 12.3$
- B)  $Y = 2.17x + 3.77$
- C)  $Y = -0.46x + 9$
- D)  $Y = -2.17x - 9.35$

*Notice the slope of the line is negative (not B). Notice the intercept is above 10 (not B, C, or D).*

**Answer: A**

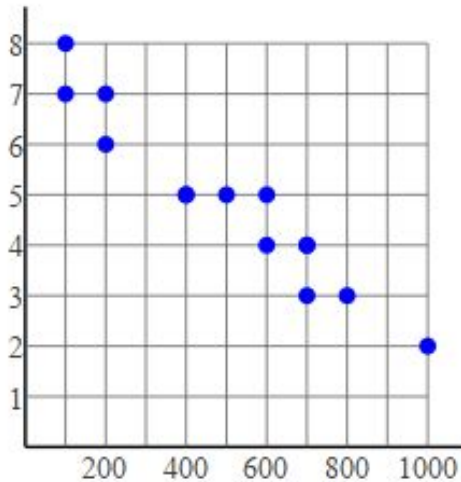
# Practice 2:

*Answer Key provided*

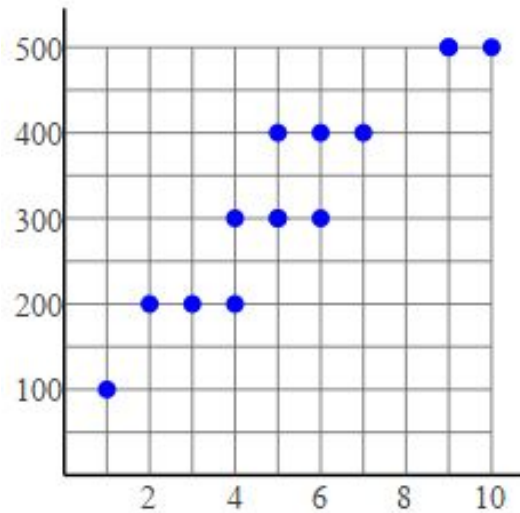
Draw a line of best fit.

Then write the equation (in slope-intercept form) for the line.

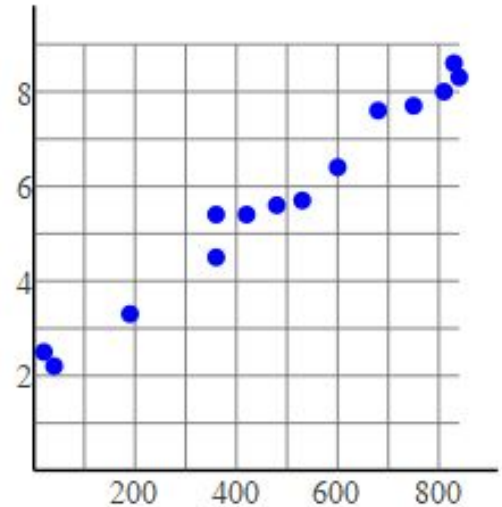
①



②

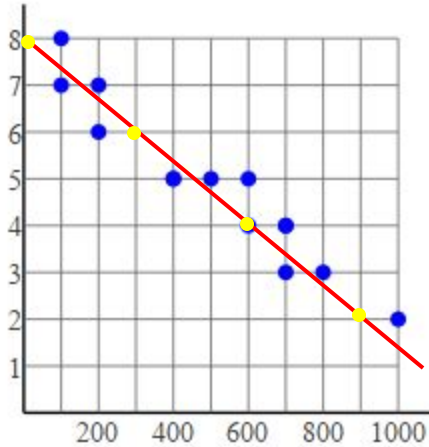


③



# Practice 2: *Answer Key*

①

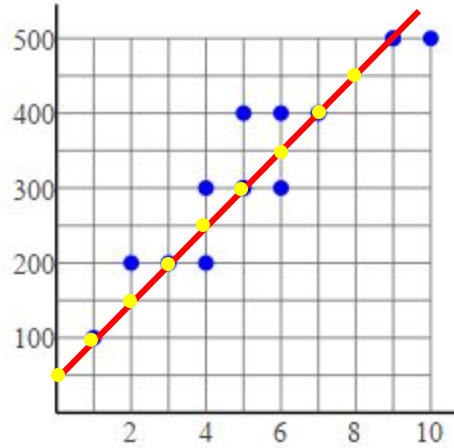


$$y = -\frac{2}{300}x + 8$$

or

$$y = -\frac{1}{150}x + 8$$

②

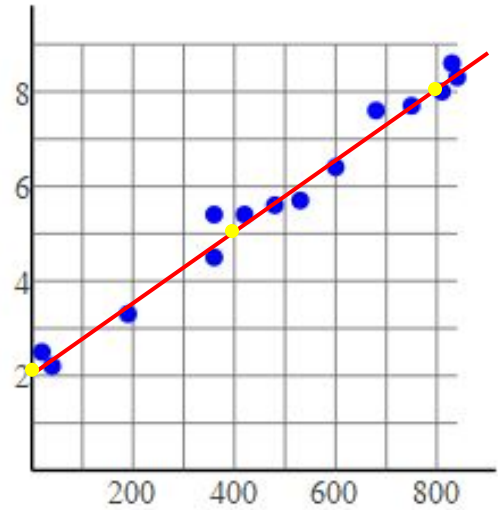


$$y = \frac{50}{1}x + 50$$

or

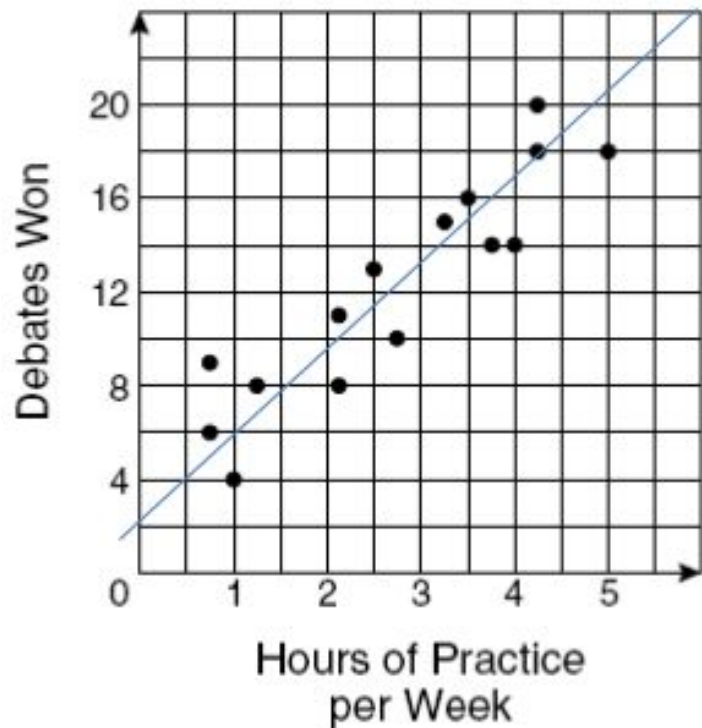
$$y = 50x + 50$$

③



$$y = \frac{3}{400}x + 2$$

**Exit Ticket:** *The coaches of a group of debate teams answered a survey about hours of debate team practice and number of team wins. The graph shows the results of this survey. Which equation best represents the line of best fit?*



A)  $y = 7x + 5$

B)  $y = -2x + 1$

C)  $y = 4x + 2$

D)  $y = 4x + 8$

# Additional Resources:

[Khan Academy Lesson and Additional Practice](#)