

**US-13 Two Point Word Problems** Algebra Name: \_\_\_\_\_ Period: \_\_\_\_\_

**Solve the following word problems.**

**Example:**  
If you get a good score on your SAT does that mean that you have a good chance of graduating from college? The University of Florida (FL) has an average SAT of 1135 and a graduation rate of 64%. Wake Forest University (NC) has an average SAT of 1250 and a graduation rate of 86%. You are going to be asked to write an equation to find the graduation rate.

- Define your variables.
- Write the ordered pairs
- Write an equation to find the graduation rate.
- What would be the expected graduation rate for a college that has an average SAT score of 1235?

Define your variables

- Let  $x$  equal the average SAT scores
- Let  $y$  equal the graduation rate in percent

Write the ordered pairs

- The University of Florida: (1135, 64)
- Wake Forest University: (1250, 86)

Write an equation to find the graduation rate.

$m = \frac{y_2 - y_1}{x_2 - x_1}$	Formula for Slope	$y - y_1 = m(x - x_1)$	Point-Slope Form
$m = \frac{86 - 64}{1250 - 1135}$	Substitute	$y - 64 = .19(x - 1135)$	Substitute
$m = \frac{22}{115}$	Simplify	$y - 64 = .19x - 215.65$	Distribute
$m = .19$	Rounded to the Hundredth	$y = .19x - 151.65$	Add 64 to both sides

What would be the expected graduation rate for a college that has an average SAT score of 1235?

$y = .19x - 151.65$	Your equation for the graduation rate
$y = .19(1235) - 151.65$	Substitute
$y = 24.65 - 151.65$	Multiply
$y = 83$	Simplify
83%	The expected graduation rate

1) Hector and Henry want to make some CDs for their band. Cost Channel Music. Hector's friend K would cost \$399 to produce 1000 CDs. Hector figures it would cost \$425 to produce 1500 CDs. They had no choice. You are going to write an equation to find the cost of producing CDs this.

Define variables:  $y = \dots$  CDs

Write 2 ordered pairs for Hector's numbers and one for Henry's

$H: (1000, 399)$   $J: (1500, 425)$

Write the equation for Hector's numbers:  $y = .35x - 28.25$

$399 - 54.25 = 344.75$   
 $1000 - 75 = 925$   
 $\frac{344.75}{925} = .35$  per CD

- What does the slope of this equation represent?
- What does the y-intercept of this equation represent?
- Use your equation to find how much it would cost to produce 50 CDs.

2) Mr. Prichard put 90 pounds of yard waste in the back of his pickup truck to take to the composting facility. When the truck was loaded with the yard waste, the total weight was 114 pounds (the pickup). Use the info above from the composting facility to write an equation to find the weight of the yard waste. Write 2 ordered pairs for the info and use them to write an equation for the weight of the pickup off the ground.

- Write 2 ordered pairs, one for the yard waste and one for the pickup.
- Define the variables. What does the first number of the ordered pair represent? The second?

Find the slope of the line between the two points:  $m = \frac{2-11}{300-1200} = \frac{-9}{-900} = .01$

$(300, 13.25)$   $(1200, 11)$

$11 - 13.25 = -2.25$   
 $1200 - 300 = 900$   
 $\frac{-2.25}{900} = -.0025$

$y = -.0025x + b$   
 $11 = -.0025(1200) + b$   
 $11 = -3 + b$   
 $+3 +3$   
 $14 = b$

$y = -.0025x + 14$

$y = .35x + 49$  (15, 54.25)

$54.25 = .35(15) + b$   
 $54.25 = 5.25 + b$   
 $-5.25 -5.25$   
 $49 = b$

- Use the point slope formula to find an equation for the height the bumper is off the ground then transform it into slope-y-intercept form.
- What does the y-intercept of this equation represent?
- Use your equation to find how far off the ground the bumper would be if all that was in the back of his pickup was a 100 pound ladder rack.

3) Mrs. Prichard enters her classroom at 7:00 am and finds the temperature to be 86 degrees. She immediately turns on the air conditioner. By noon the temperature was down to 76 degrees. The temperature went down at an even rate while the air conditioning was running. Write an equation to find the temperature in Mrs. Prichard's room.

- Write 2 ordered pairs
- Define variables
- Use the point slope formula to find an equation for the temperature in Mrs. Prichard's room and then transform it into slope-y-intercept form.

- What is the slope and what does it represent in this equation?
- About what was the temperature in the room at 10:00 am?

Dec 8-10:05 AM

4) Anahí has noticed that how long it takes to get food at her favorite restaurant depends on how many people are in her party. If she just goes with one other person they get their food in about 10 minutes. If she goes with her family- the five of them will take about 16 minutes to get served. You are going to be asked to find an equation to find how long it takes to get served at Anahí's favorite restaurant.

- Write 2 ordered pairs
- Define variables
- Use the point slope formula to find the equation (in slope intercept form) for how long it takes to get served at Anahí's favorite restaurant.

- What is the slope and what does it represent in this equation?
- Use your equation to find how long it would take Anahí to get served if she went with her family and her boyfriend.