

Lesson 3: Working With Linear Relations | Unit 1 – Linear Relations

(A) Applying the Basic Skills: Ex 2: → Commission

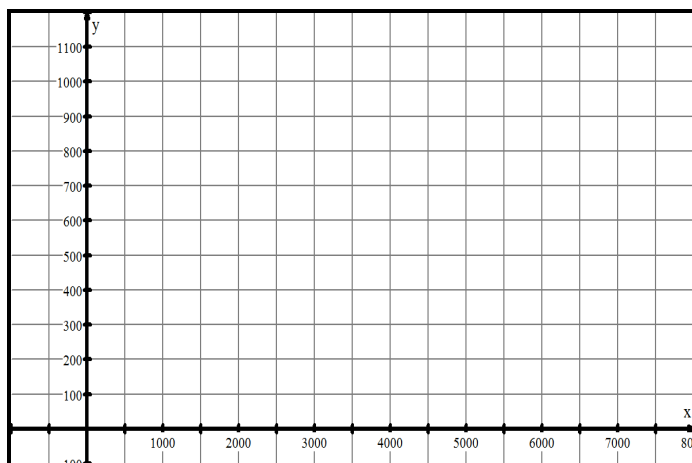
Verbal Description:

John works at a clothing store and his weekly salary is \$300 and he earns 5% commission on his weekly sales.

Data Table:

sales	0	1000	2000	3000	4000	5000
earnings						

Graph:



Equation:

Slope:

Meaning of Slope:

Y-intercept:

Meaning of y-intercept :

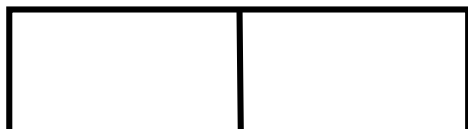
Questions:

- When will John's earnings be \$700?
- What will be John's earnings if he sells \$6,525 worth of clothing?
- John gets a raise in pay and now earns a base salary of \$500, but his commission remains at 5% of total sales. Write a new equation and graph it on the grid. What is similar about the 2 graphs? What is different about the 2 graphs.
- John now gets a raise in pay. He stills earns a base salary of \$300, but his commission is now 7.5% Write a new equation and graph it on the grid. What is similar about the 2 graphs? What is different about the 2 graphs.
- John now gets promoted to Store Manager and earns a weekly salary of \$1100. and graph it on the grid. What does this graph look like?

(B) Applying the Basic Skills → Geometry Problems → Perimeter of a rectangle

Verbal Description:

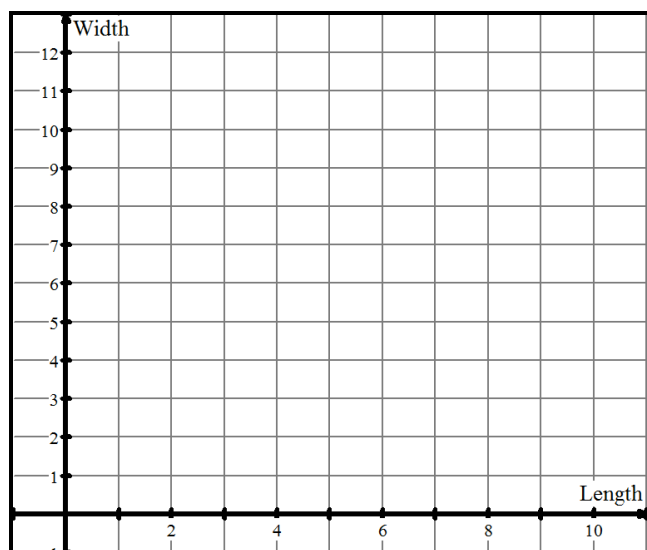
Mr Santowski is constructing 2 adjacent, rectangular pens to contain puppies, as illustrated below. I have 24 meters of fencing material available.



Data Table: List some possible values for the length and width of the pens.

length					
Width					

Graph:



Equation:

X-intercept:

Meaning of x-intercept:

Y-intercept:

Meaning of y-intercept :

Questions:

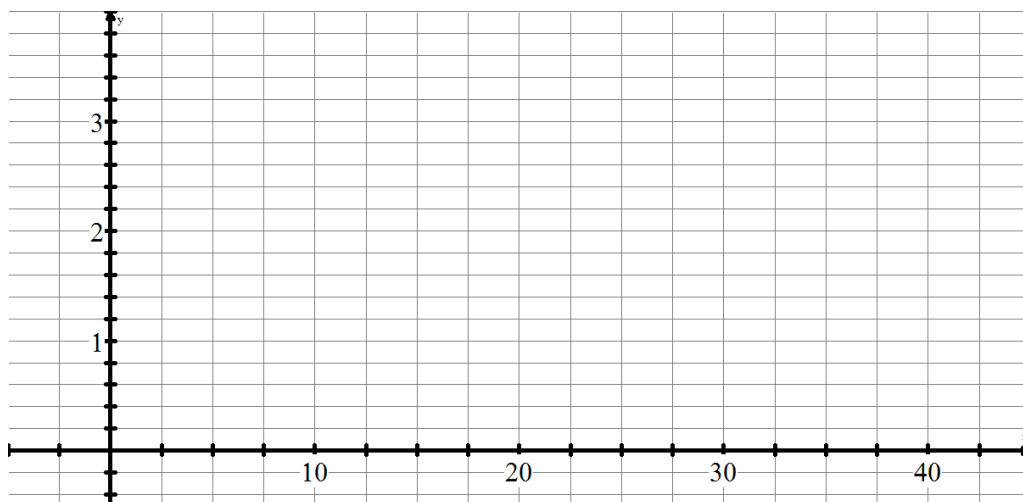
- Write the equation in standard form.
- Write the equation in slope-intercept form.
- What does the slope mean in this question?
- Which form do you find easiest for this problem? Why?
- State the domain and range of this function and explain your thinking.

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(C) Piecewise Relations: Exploratory Example:

- a. A long distance calling plan charges \$1.29 for any call up to 20 minutes in length and 7 cents for each additional minute (or each part of a minute)
- What is the independent variable (input)? What would the domain be?
 - What is the dependent variable (output)? What would the range be?
 - Would you expect this relation to be a function? Why/why not?
 - Determine the cost of a 52 minute phone call.
 - How long would a call be if you had to pay \$2.41.
 - To help draw a graph, complete the following table of values. Then graph this relation.

Time (min)	0	5	10	15	20	25	30	35	40
Cost (\$)									



Now, how would you write an equation for this relation?

(D)

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(E) Applications of Linear Relations

1. Mr. Santowski was mowing lawns to make money for a video game! Mr. Santowski has 5 dollars in the bank. And for every lawn that he mows, he earns 3 dollars!

Equation in Slope Intercept Form:

Slope = _____

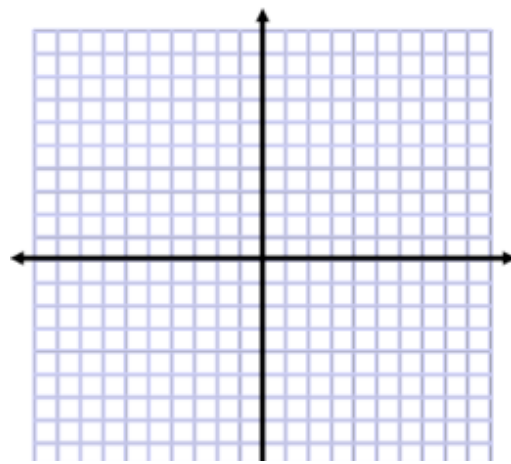
What does the slope mean in the context of the problem: _____

Y-intercept = _____

Real world meaning of the y-intercept: _____

What does x represent? _____

What does y represent? _____



If Mr. S bought a videogame for 62 dollars... how many lawns did he mow? Show your work!

Does the point (4,17) lie on this graph? What does that point mean in the real world? Show your work!

Is there a part of the graph we should not include?

2. Mr. Smith is going BALD!!! Today, he has 7,000 hairs left on his head. If he loses 100 hairs every 4 days, then create a linear equation to model this situation!

Equation in Slope Intercept Form:

Slope = _____

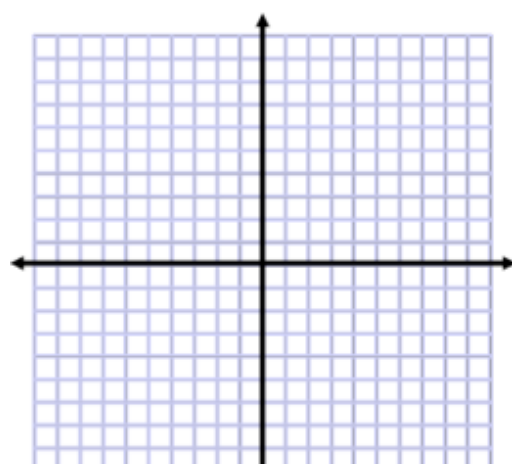
What does the slope mean in the context of the problem: _____

Y-intercept = _____

Real world meaning of the y-intercept: _____

What does x represent? _____

What does y represent? _____



On what day can Mr. Smith expect to be Bald... give me the exact calendar day! Show work

Does the point (150, 3250) lie on the graph. What is the real world meaning of this point? Show work!

How did you have to change your graph to make this one fit?...

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Put the following equation into $y = mx + b$ form. Then write a story problem that goes with the numbers of the equation.

$$y - 1500 = 25(x - 20) \rightarrow y = mx + b$$

$y =$ _____

Story: _____

Equation in Slope Intercept Form:

Slope = _____

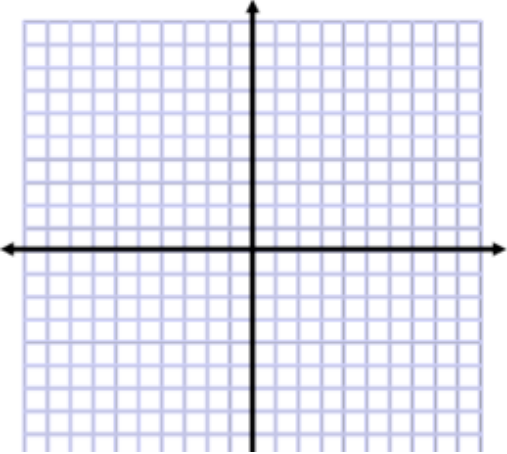
What does the slope mean in the context of the problem: _____

Y:intercept = _____

Real world meaning of the y-intercept: _____

What does x represent? _____

What does y represent? _____



Create a problem for other students to solve based off of your story problem

Create a problem that deals with a point lying on the graph... and the real world meaning of that point.

Draw a picture or a comic strip that explains your problem in detail!