

(A) Lesson Objectives:

- a. Review Linear Equation in the form of $y = mx + b$
- b. Review Linear Equations in the form of $Ax + By = C$
- c. Apply Linear Equations to Real World Applications

(B) Fast Five:

- a. For the equation $y = 2x - 3$:
 - i. EXPLAIN how to graph the equation
 - ii. Complete a data table
 - iii. Determine the slope and the y-intercept

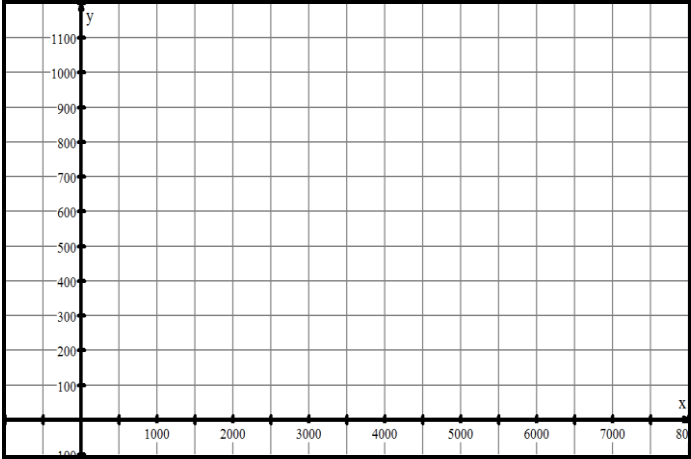
(C) Explorations:

- a. House Values

<p>Verbal Description:</p> <p>Mr Santowski has a summer cottage for which he paid \$120,000. Each year, the value of the house increases by \$8,000.</p>	<p>Data Table:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 10%;">x</td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> </tr> <tr> <td>y</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	x							y						
x															
y															
<p>Graph:</p>	<p>Equation:</p> <p>Slope:</p> <p>Meaning of Slope:</p> <p>Y-intercept:</p> <p>Meaning of y-intercept :</p>														
<p>Questions:</p> <ul style="list-style-type: none"> (a) When will my cottage be worth \$200,000? (b) What will be the value of my cottage in 4 years time? (c) When will the value of my cottage be double its original value? (d) At what rate is the value of the house changing from year to year? 															

- (C) Explorations:
 b. Income & earnings

<p>Verbal Description:</p> <p>John works at a clothing store and his weekly salary is \$300 and he earns 5% commission on his weekly sales.</p>	<p>Data Table:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 5px;">sales</td> <td style="padding: 5px;">0</td> <td style="padding: 5px;">1000</td> <td style="padding: 5px;">2000</td> <td style="padding: 5px;">3000</td> <td style="padding: 5px;">4000</td> <td style="padding: 5px;">5000</td> </tr> <tr> <td style="padding: 5px;">earnings</td> <td style="padding: 5px;"></td> <td style="padding: 5px;"></td> <td style="padding: 5px;"></td> <td style="padding: 5px;"></td> <td style="padding: 5px;"></td> <td style="padding: 5px;"></td> </tr> </table>	sales	0	1000	2000	3000	4000	5000	earnings						
sales	0	1000	2000	3000	4000	5000									
earnings															

<p>Graph:</p> 	<p>Equation:</p> <p>Slope:</p> <p>Meaning of Slope:</p> <p>Y-intercept:</p> <p>Meaning of y-intercept :</p>
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Questions:

- (a) When will John's earnings be \$700?
- (b) What will be John's earnings if he sells \$6,525 worth of clothing?
- (c) 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.
- (d) 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.
- (e) 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?

(C) Explorations:

c. Environmental Issues

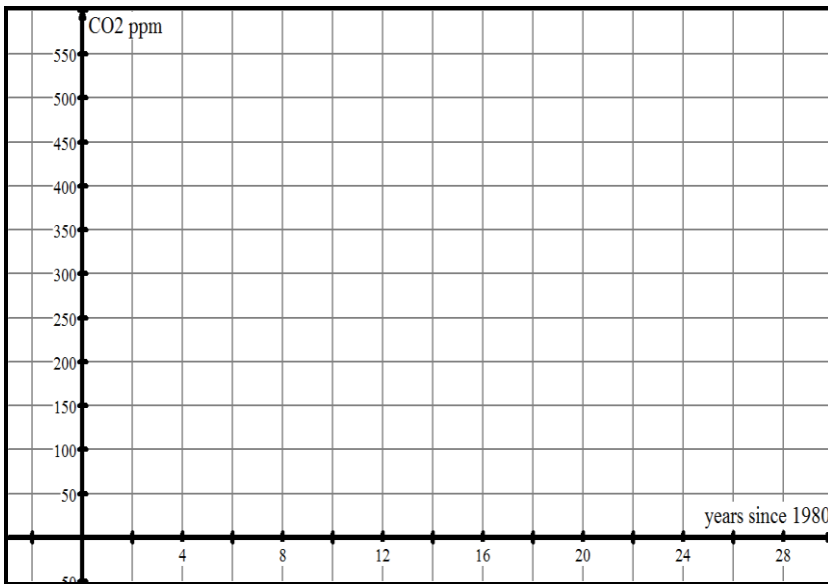
Verbal Description:

The amount of CO₂ (in ppm) in the air at the Mauna Loa Astronomical Observatory has been measured regularly since 1959. In 2000, the amount of CO₂ recorded was 369.40 ppm while in 2012, the amount was 389.78 ppm.

Data Table:

Years since 1959		
CO ₂ levels in ppm		

Graph:



Equation:

Slope:

Meaning of Slope:

Y-intercept:

Meaning of y-intercept :

Questions:

- (a) When will the CO₂ levels be at 600 ppm?
- (b) What was the amount of CO₂ in the air in June of this year?
- (c) If I give you an additional data point, (in the year 2005, the measured amount was 379.78), will your equation change? Why? How?
- (d) Interpret the statement “The 2005 rate of increase was 2.14 PPM per year”

(C) Explorations:

d. Health Issues

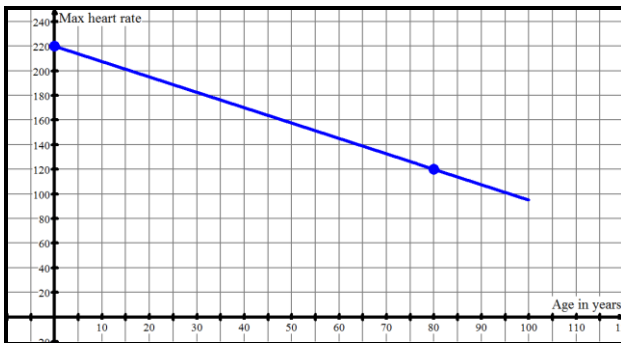
Verbal Description:

The graph below shows the relationship between a person's maximum heart rate and their age.

Data Table:

age	0	80
Max heart rate	220	120

Graph:



Equation:

Slope:

Meaning of Slope:

Y-intercept:

Meaning of y-intercept :

Questions:

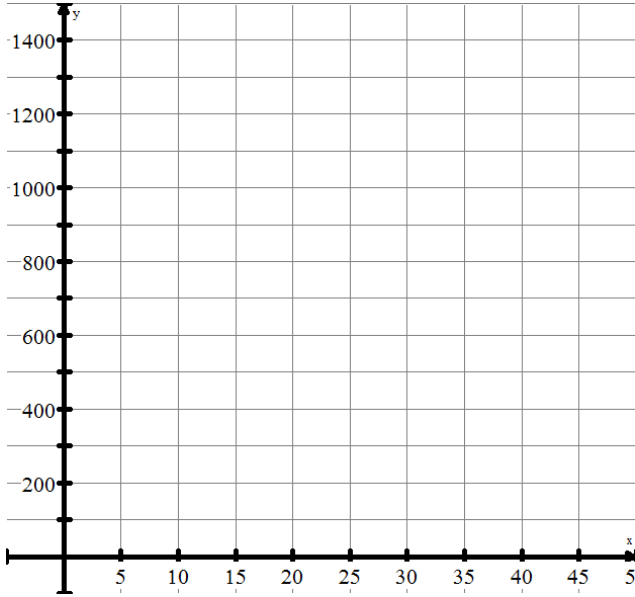
- For what age will maximum heart rate be 170 beats per minute?
- What is the maximum heart rate for a 50 year old athlete?
- At what rate is the max heart rate decreasing from year to year?

(C) Explorations:

e. Cost Comparison

A hockey team wants to rent a banquet hall for their year end party. J.R's charges \$500 to rent the room, plus \$15 per meal. Patti's Party Palace charges \$400 for the hall, plus \$18 per meal.

Graph:



DEFINE YOUR VARIABLES, then complete the tables

Data Table:

x						
y						

Data Table:

x						
y						

- (a) Write 2 equations.
- (b) What do the slopes mean?
- (c) What do the x- and y-intercepts represent?
- (d) Use algebra to write and solve a single equation that can be used to determine when the banquet costs are equal.

(C) Explorations – Equations in Standard Form:

f. Salary and Earnings

Verbal Description:

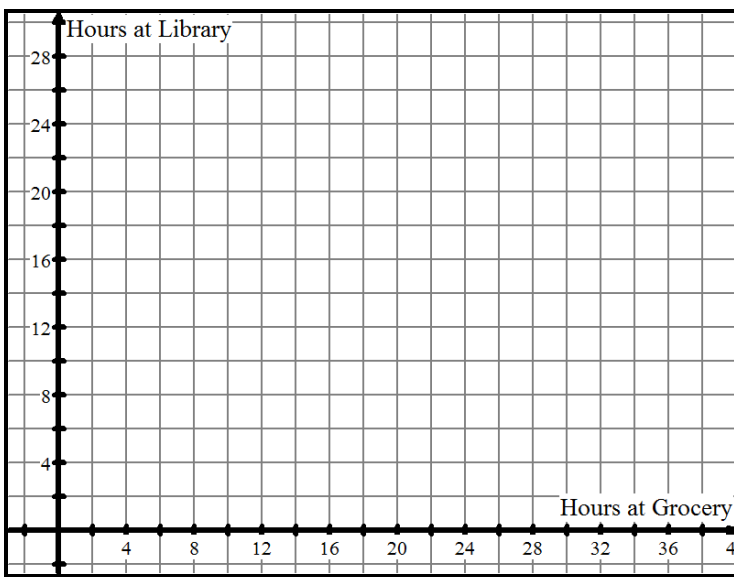
Sally has 2 part time jobs. At the grocery store, Sally earns \$8/hr and at the library, she earns \$10/hr. Before going on vacation, she would like to earn and save \$280. Determine various combinations of hours worked that she needs to work to achieve this goal.

Let L represent the hours worked at the library
 Let G represent the hours worked at the grocery

Data Table: List some possible combinations of hours worked at both location.

Hours at Grocery					
Hours at Library					

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.
- Which form do you find easiest for this problem? Why?