(A) Lesson Context

BIG PICTURE of this UNIT:	• What is meant by the term FUNCTIONS and how do we work with them? • mastery with working with basics & applications of linear functions • mastery with working with basics & applications of linear systems • understanding basics of function concepts and apply them to lines & linear systems		
CONTEXT of this LESSON:	Where we've been In Lesson 5, you graphed data sets as scatter plots & wrote linear functions for the trend line of those data set	Where we are Writing equations of lines in multiple forms & continuing to put linear functions into context.	Where we are heading Mastery of working with multiple representations of f(x) = mx + b

(B) Lesson Objectives:

a. Continue working with equations of linear relations written in the form of $y = mx + b$
b. Continue working with equations of linear relations written in the form of $y - y_1 = m(x - x_1)$
c. Introduce how we can work with equations of linear relations written in the form of $Ax + By = C$
d. Continue working with equations of linear relations in real world applications

(C) Review Exercise: FAST FIVE

1. Find the equation of line that passes through A(-4,12) and B(7,4).

2. Write the equation of a line that is parallel to the given line $y = 2 - 3x$ and passes through the point (5,-1).

3. Write the equation of a line that is perpendicular to the line $2x - 3y - 9 = 0$ and has a zero at -3.

4. If $3x + 4y = 24$, determine the value of $\frac{f(3) - f(1)}{3 - 1}$.

(D)Explorations – Equations in Standard Form ➔ 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 in order to earn the $280.

Hours at Grocery					
Hours at Library					

Equation:

X-intercept:

Meaning of x-intercept:

Y-intercept:

Meaning of y-intercept :

Questions:

a. Write the equation in standard form.

b. Write the equation in slope-intercept form.

c. What is the slope and what does it mean in this question?

d. What is the domain and range of this function? Why?

(E) Explorations ➔ Health Issues

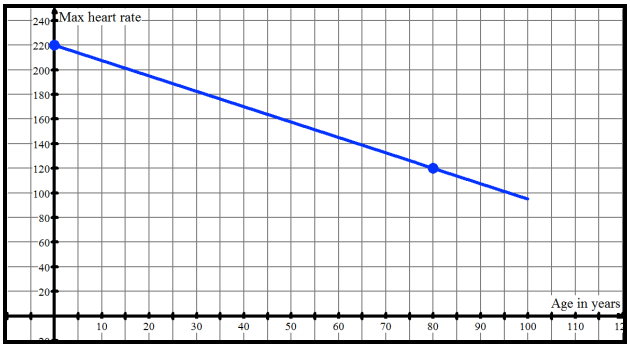
Verbal Description:

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:

(a) For what age will maximum heart rate be 170 beats per minute?

(b) What is the maximum heart rate for a 50 year old athlete?

(c) At what rate is the max heart rate decreasing from year to year?

(d) Evaluate R(49) and interpret.

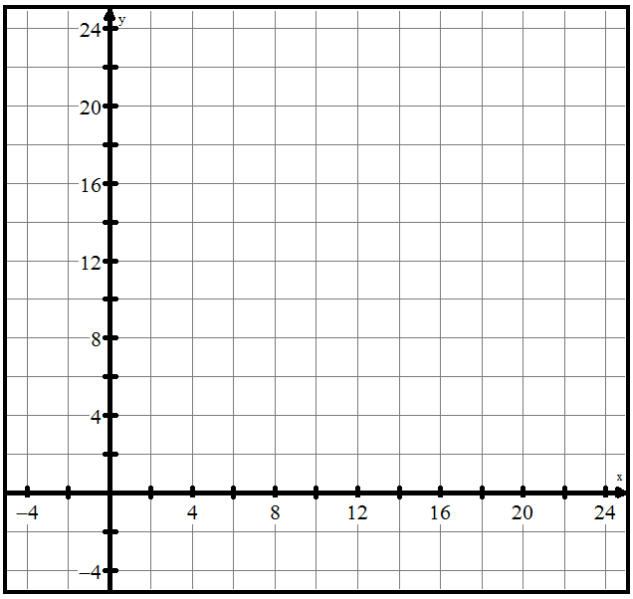
(e) Solve R(y) = 0 and interpret. Is this value reasonable or not?

(f) State the domain and range of this function. Explain.

(F) Explorations ➔ Mixtures

A candy store is preparing a mixture of chocolate raisins and chocolate peanuts. The raisins are sold for $2.25/kg and the peanuts are sold for $1.75/kg. They will produce a 20 kg mix that they will sell for $41 (or $2.05/kg).

Graph:



DEFINE YOUR VARIABLES, then complete the tables

Data Table: List some possible combinations of amounts of raisins & peanuts to account for the 20 kg.

Amt of Raisins					
Amt of Peanuts					

Data Table: List some possible combinations of amounts of raisins & peanuts to account for the VALUE of $41.

Amt of Raisins					
Amt of Peanuts					

Questions:

(a) Write an equation for the amount of the mixture made.

(b) What do the x- and y-intercepts represent?

(c) What would be the domain and range of this function?

(d) Write an equation for the total cost of the mix.

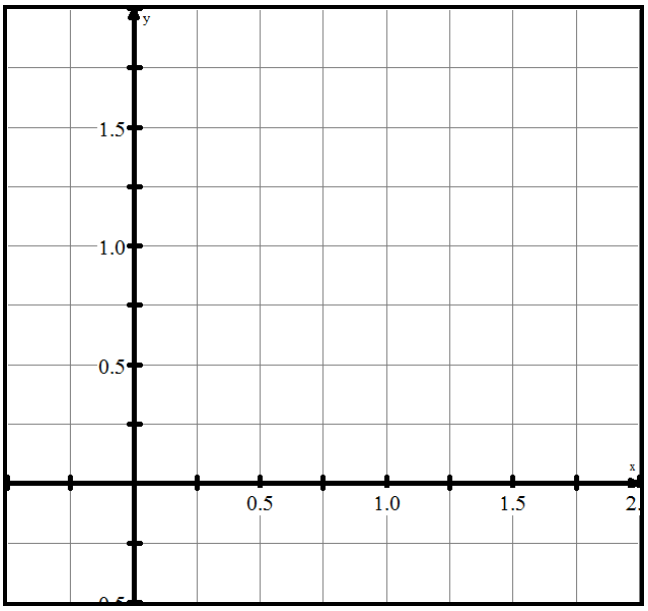
(e) What do the x- and y-intercepts represent?

(f) What would be the domain and range of this function?

(G)Explorations: Equations in Standard Form - Rates

Jose travelled 95 km from Oakville to Oshawa by car and by train. The car averaged a speed of 60 km/hr and the train averaged 90 km/hr. The whole trip took 1.5 hours of travel time.

Graph:



DEFINE YOUR VARIABLES, then complete the tables

Data Table (time):

x						
y						

Data Table (distance):

x						
y						

Questions:

(a) Write an equation for the time travelled.

(b) What do the x- and y-intercepts represent?

(c) Write an equation for the distance travelled.

(d) What do the x- and y-intercepts represent?

(e) Use algebra to write and solve a single equation that can be used to determine how much time was spent travelling by car.

(H) 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)

   i. What is the independent variable (input)? What would the domain be?

   ii. What is the dependent variable (output)? What would the range be?

   iii. Would you expect this relation to be a function? Why/why not?

   iv. Determine the cost of a 52 minute phone call.

   v. How long would a call be if you had to pay $2.41.

   vi. 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?