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 3, you practiced with stating the domain and range of functions	Where we are Using technology to produce graphs of functions & then apply various function concepts	Where we are heading Mastery of working with multiple representations of f(x) = mx + b

B. Lesson Objectives

a. Use technology (TI-84 and DESMOS) to generate graphs of functions.
b. Use the graphs generated to apply various function concepts like domain, range, evaluate and solve

C. Fast Five (Skills Review Focus)

Mr. Rawlings just purchased a new phone for $850. M. Rawlings is also very clumsy and he drops his phone often For every 3 times he drops his phone is loses $90 in value. Please come up with an equation that model the value of Mr. Rawlings phone in all three forms.

Point Slope Form	Slope Intercept Form	Standard Form

Extension Questions:

1. What is the independent variable in this problem?

2. What is the dependent variable in this problem?

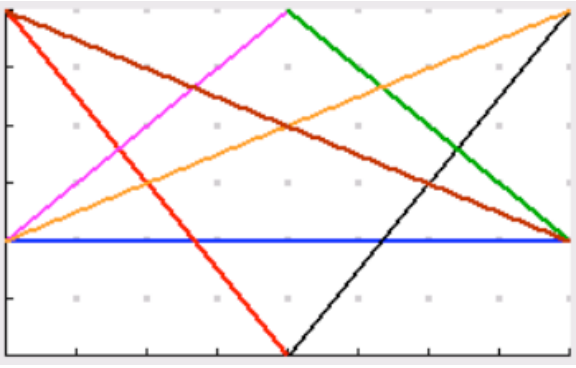
3. What does the gradient mean in this problem?

4. What does gradient me to you? When we say the word "Slope or Gradient" what do you think of?

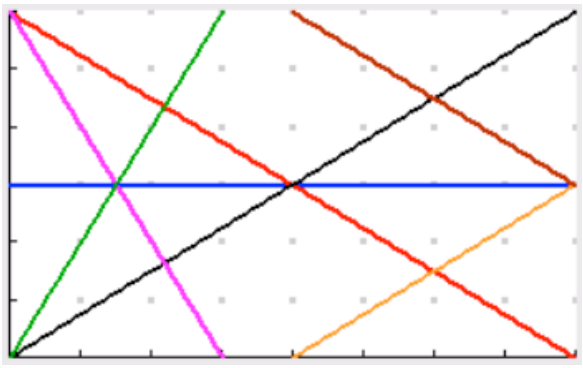
D. Line Factory Logo

The Line Factory needs a new logo for its pamphlet. After much work by the design staff, the two logos shown below were proposed.

The only problem is that the staff clerks need to have the equations of the lines in each design to program their pamphlet-production software.



Logo A



Logo B

Your Task: Find the equations of the lines in Logo A and B and recreate the graphs on your calculators. Split your team into two pairs so that one pair works on Logo A while the other works on Logo B.

Find the equations of the lines in your design and then use your grapher to check them.

Equations	

Also, be sure to set your window as shown at right so that the x-axis contains values between 0 and 8 and the y-axis contains the values between 0 and 6. Once you have found all of the equations, draw all of the lines simultaneously on the same set of aces to recreate the logo on your grapher.

Window
Xmin = 0
Xmax = 8
Xscl = 1
Ymin = 0
Ymax = 6
Yscl = 1

F. Balloon Problem

Lara decides to take a ride in a hot-air balloon and her position in meters above the ground is shown in the graph below.

1. What is the independent variable in this function? What is the dependent variable?

2. For which values t will the balloon be descending?

3. What will Lara's height above the ground be at 2 minutes after the beginning of the ride?

4. During the first two minutes, at what rate is the balloon rising?

5. What linear function describes the height of the balloon above the ground for the first two minutes?

6. For each of the first two minutes the balloon's height increases by _____ meters.

7. What linear function describes Lara's height above the ground for the last two seconds of the ride?

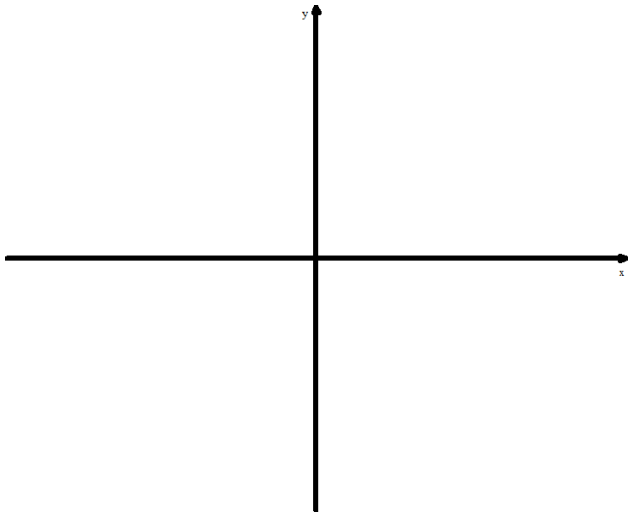
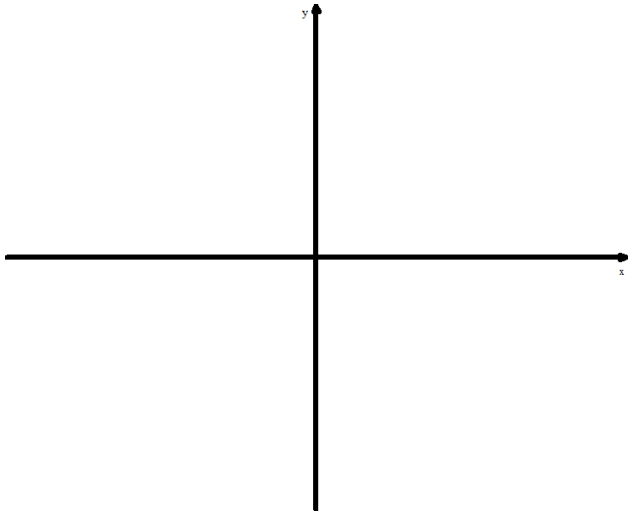
8. What is the meaning of the slope of the function you created in question 8?

9. What is the longest period of time for which her height above the ground is not changing?

10. What equation describes the height of the balloon for that period of time?

11. Find equations for the height of the balloon for the other times when its height is not constant.

E. Graphs of Functions

We will give you instructions on HOW to use the TI-84 graphing calculator as well as DESMOS in order to prepare graphs of the functions and/or relations when presented with an EQUATION The most important part of this exercise will be to set your VIEW WINDOW SETTINGS, so that you see the graph of the function, rather than just empty space!!	Once you generate a graph of a function, you will be expected to SKETCH a copy of the graph. Here is a list of the key details that should appear in your sketches: • The x- and y-axis • Key points (usually x- and y-intercepts but also maximum and minimum points • Have the correct "shape" of the function • Label the function with its equation
EXAMPLE 1 ➔ Graph the function $f(x) = 4 - \frac{1}{2}x$. From your graph (or from your calculator or from algebra), determine the : Domain➔ Range ➔ x-intercept ➔ y-intercept ➔ f(-2) = What value of x makes f(x) = -8?	
EXAMPLE 2 ➔ Graph the function $f(x) = 2x - 8$. From your graph (or from your calculator or from algebra), determine the : Domain➔ Range ➔ x-intercept ➔ y-intercept ➔ f(-4) = What value of x makes f(x) = 22?	

Graphs of Functions

EXAMPLE 3 ➔ Graph the function $f(x) = 12 + \frac{1}{3}x$.

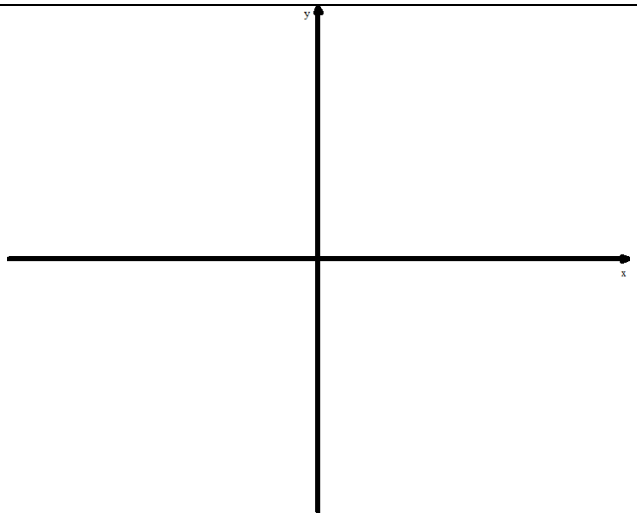
From your graph (or from your calculator or from algebra), determine the :

Domain➔ Range ➔

x-intercept ➔ y-intercept ➔

f(6) =

What value of x makes f(x) = -8?



EXAMPLE 4 ➔ Graph the function $f(x) = 15x + 100$.

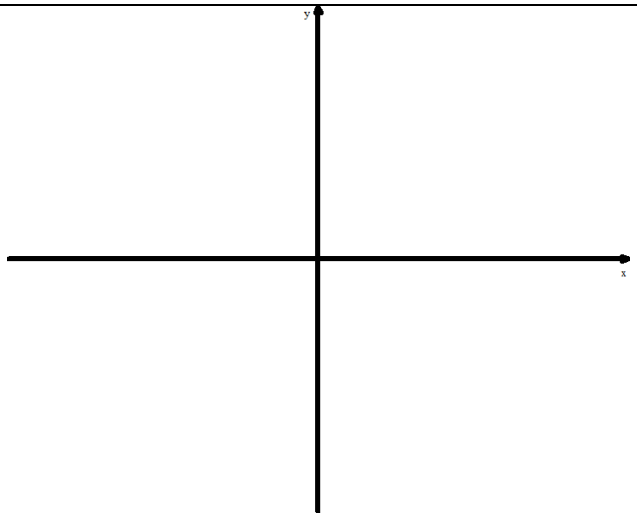
From your graph (or from your calculator or from algebra), determine the :

Domain➔ Range ➔

x-intercept ➔ y-intercept ➔

f(10) =

What value of x makes f(x) = 400?



EXAMPLE 5 ➔ Graph the function $f(x) = x + 3$ on the domain $\{x \in R | x \leq 5\}$.

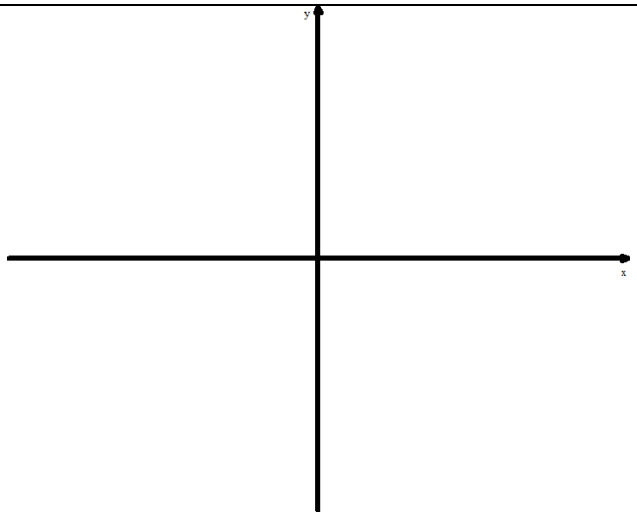
From your graph (or from your calculator or from algebra), determine the :

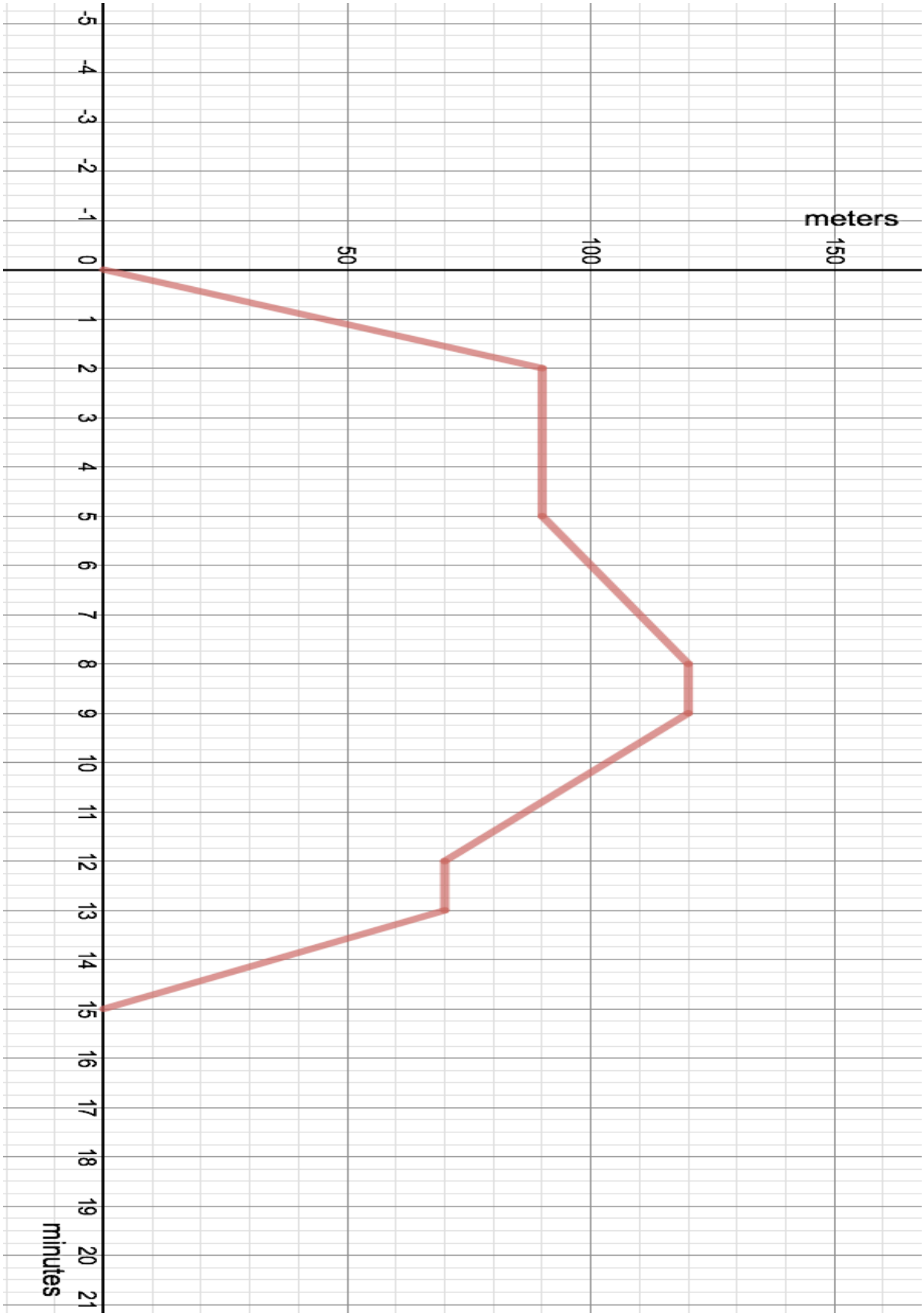
Domain➔ Range ➔

x-intercept ➔ y-intercept ➔

f(-4) =

What value of x makes f(x) = 10?

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