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 4, you practiced graphing linear functions using technology	Where we are Graphing Lines of Best Fit to models linear trends in data sets	Where we are heading Mastery of working with multiple representations of f(x) = mx + b

B. Lesson Objectives

a. Introduce the coefficient of correlation & its meaning & relevance.
b. Graph lines of best fit to data sets on scatter plots & write the corresponding equation for the LoBF
c. Generate lines of best fit to data sets using EXCEL and TI-84 and compare the technology generated equations to our own lines

C. Fast Five (Skills Review Focus)

(a) Graph the function $f(x) = -\frac{1}{2}x - 4$ on the range $\{y \in R | y > -8\}$.

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?

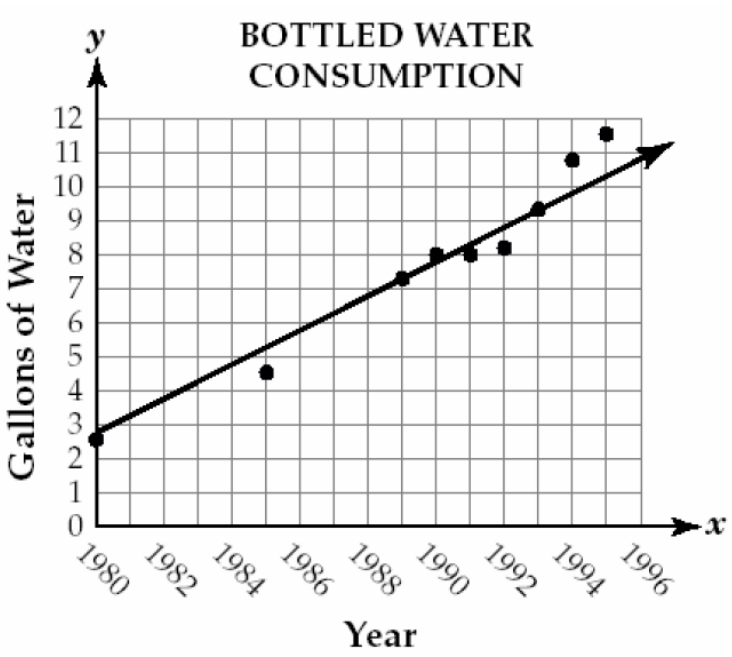
(b) Determine the equation of the line going through the points A(-3,5) and B(3,-7). Write the equation in the form of f(x) = mx + b.

(c) Use your equation to evaluate f(7) and f(8)

(d) Evaluate the value of the difference f(8) – f(7). Comment.

D. Skills Practice ➔ Lines of Best Fit & Scatter Plots

4. Take a look at the graph with a line of fit below. Answer the questions at the right.



Questions about the Line of Fit

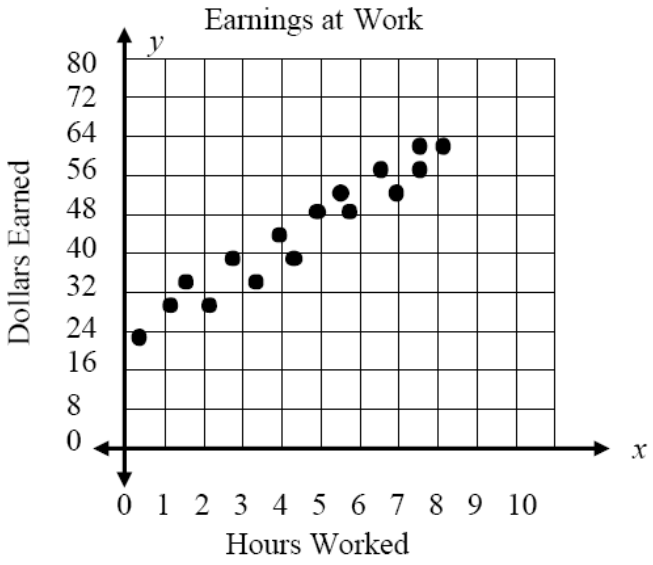
5. Is the slope of the line positive or negative?

6. According to the line of fit, about how many gallons of water will be consumed in 1996?

7. According to the line of fit, when the year increases by 5 years, how many gallons of water increase?

8. What is the y-intercept of the line of fit?

3. The graph below shows the earnings that Jim makes on his newspaper route. Because he gets paid by commission, he doesn't always earn the same amount. In the graph below, sketch a line of fit as best you can and then answer the questions…



Questions about the Line of Fit

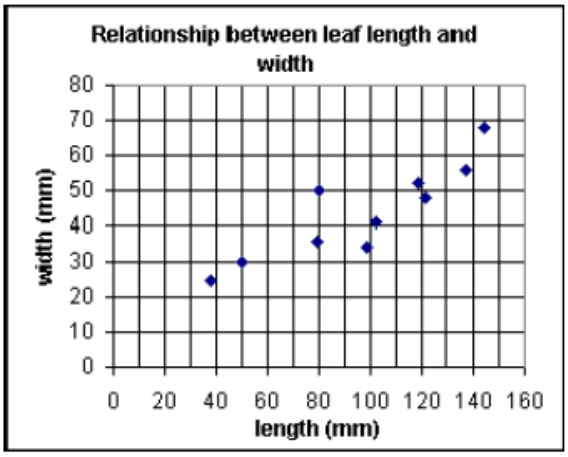
1. How many dollars did Jim earn for working 5 hours?

2. Using your line of fit, predict how many dollars Jim will earn for working 10 hours.

3. Is the slope of your line of fit positive or negative?

4. What is the y-intercept of your line of fit?

2. The length and width of 10 leaves are shown on the scatter diagram (side).



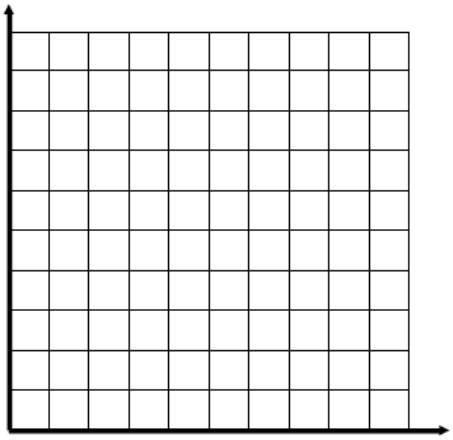
(a) Plot the point M(97,44) which represents the mean length and the mean width on the diagram.

(b) Draw a suitable line of best fit.

(c) Write a sentence describing the relationship between leaf length and leaf width for this sample.

Every year since 1990, the number of runners in the U.S. has grown. Below is a chart of the number of runners in the hundreds of thousands.

Year	*Year since 1990*	*Runners*
1994		5.5
1995		5
1996		6
1997		7
1998		6.7
1999		7
2000		7.1
2001		7.5



a. What is the equation of the line of best fit?

b. Predict the number of runners in 1985? Is this a reasonable answer? Why or why not?

c. Predict the number of runners in 2050? Is this a reasonable answer? Why or why not?

E. Further Skill Application – Using Technology

2. *Active Dentists in the U.S.*

Year (x)	0	5	10	15	20	25	30
Number of Dentists (y)	154	152	149	147	144	136	121

- Is there any constant rate of change with this data?
- Pick any two points and calculate the slope.
- What does the slope mean in the context of this situation?
- Calculate the line of best fit. Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.
- Identify the y – intercept.
- What does the y – intercept mean in the context of this situation?

(A) For each of the following, write the prediction equation (generated using technology) and then solve the problem.

1. A student who waits on tables at a restaurant recorded the cost of meals and the tip left by single diners.

Meal Cost	$4.75	$6.84	$12.52	$20.42	$8.97
Tip	$0.50	$0.90	$1.50	$3.00	$1.00

If the next diner orders a meal costing $10.50, how much tip should the waiter expect to receive?

Equation_____ Tip expected_____

2. The table below gives the number of hours spent studying for a science exam (x) and the final exam grade (y).

X	2	5	1	0	4	2	3
Y	77	92	70	63	90	75	84

Predict the exam grade of a student who studied for 6 hours.

Equation_____ Grade expected_____