Warm Up

10/16

Each part of an equation tells the "story" about a situation.

Using the equation you got on Friday for attendance at Get Reel, tell what all the variables and numbers mean in the context of the problem.

Probability of Rain (%)	0	20	40	60	80	100
Get Reel Attendance	300	340	380	420	460	500

probability of rain

When probability of rain = 0 they can expect 300 people.

$$A_R = 2p + 300$$

Attendance for "p" probability of rain.

For every 1% increase in rain, 2 more people will attend.

Slope has units!

$$\frac{\Delta y}{\Delta x} = \frac{\#\text{ of people}}{\text{probability of rain (\%)}}$$

What do the parts of the equation tell us about the attendance at Big Fun?

Probability of Rain (%)	0	20	40	60	80	100
Big Fun Attendance	1,000	850	700	550	400	250

$\frac{\Delta y}{\Delta x}$ = Attendance / prob. of rain

probability of rain

When probability of rain = 0, there will be 1000 people.

$$A_F = -7.5p + 1000$$

Attendance at Big Fun for "p" probability of rain.

with each 1% increase in the probability of rain 7.5 fewer people will attend.

2.5 Recap -

Problem 2.5

A Use the table to find linear functions relating the probability of rain p to the following quantities.

1. Saturday attendance F at Big Fun
2. Saturday attendance R at Get Reel

Saturday Resort Attendance

Probability of Rain (%)	0	20	40	60	80	100
Big Fun Attendance	1,000	850	700	550	400	250
Get Reel Attendance	300	340	380	420	460	500

B Use your functions from Question A to answer these questions. Show your calculations and explain your reasoning.

1. Suppose there is a 50% probability of rain this Saturday. What is the expected attendance at each attraction?
2. Suppose 475 people visited Big Fun one Saturday. Estimate the probability of rain on that day.
3. What probability of rain gives a predicted Saturday attendance of at least 360 people at Get Reel?
4. Is there a probability of rain for which the predicted attendance is the same at both attractions?
5. For what probability of rain is attendance at Big Fun likely to be greater than at Get Reel?
6. For what probability of rain is attendance at Big Fun likely to be less than at Get Reel?

Our equations can be used to answer each of these questions! That's why we make them!

P

1. Suppose there is a 50% probability of rain this Saturday. What is the expected attendance at each attraction?

$A_F = -7.5p + 1000$

$A_F = -7.5(50) + 1000$

$A_F = 625$ people

$A_R = 2p + 300$

$A_R = 2(50) + 300$

$A_R = 100 + 300$

$A_R = 400$ people

2. Suppose 475 people visited Big Fun one Saturday. Estimate the probability of rain on that day.

$A_F = -7.5p + 1000$

$475 = -7.5p + 1000$

$-1000 \qquad -1000$

$-525 = -7.5p$

$\frac{-525}{-7.5} = \frac{-7.5p}{-7.5}$

$70 = p$

3. What probability of rain gives a predicted Saturday attendance of at least 360 people at Get Reel?

$A_R = 2p + 300$

$360 = 2p + 300$

4. Is there a probability of rain for which the predicted attendance is the same at both attractions?

$A_F = -7.5p + 1000$

$A_R = 2p + 300$

Attendance at BigFun = Attendance at Get Reel

$-7.5p + 1000 = 2p + 300$

$+7.5p \qquad +7.5p$

$1000 = 9.5p + 300$

$-300 \qquad -300$

$700 = 9.5p$

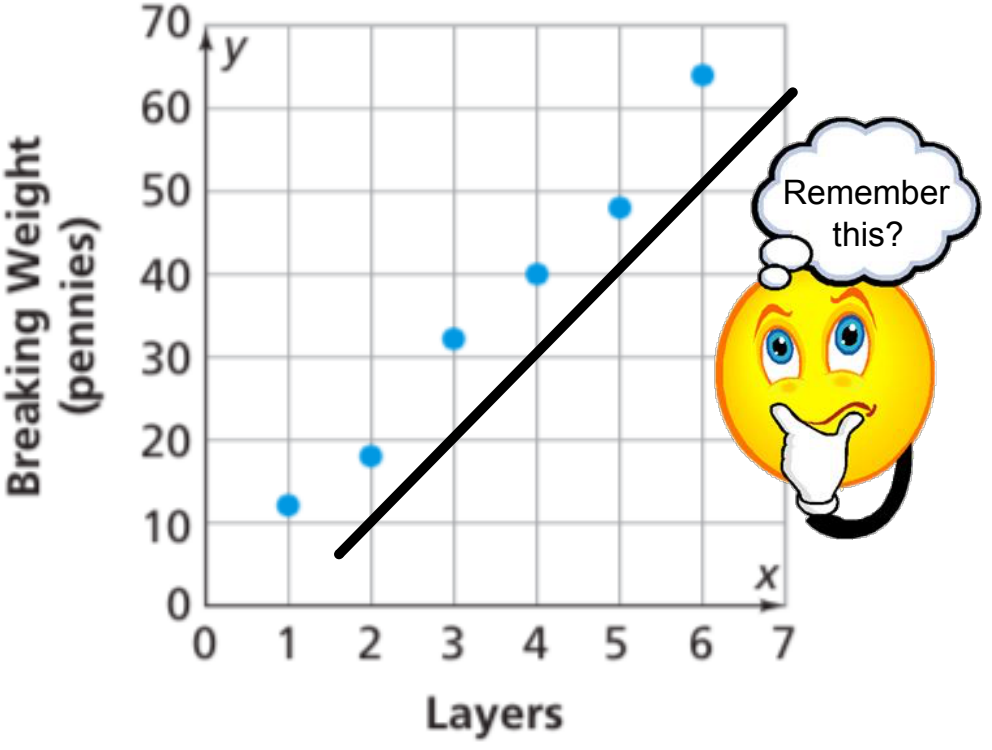
$\frac{700}{9.5} = \frac{9.5p}{9.5}$

$73.7 = p$

5. For what probability of rain is attendance at Big Fun likely to be greater than at Get Reel?

6. For what probability of rain is attendance at Big Fun likely to be less than at Get Reel?

Real life data is not always "perfect", yet it still can represent a linear relationship.



Which line do you think "models"
the plotted data the best?

Figure 1

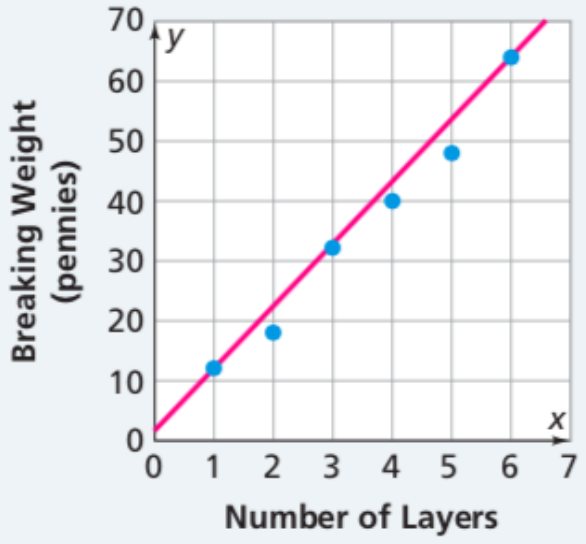
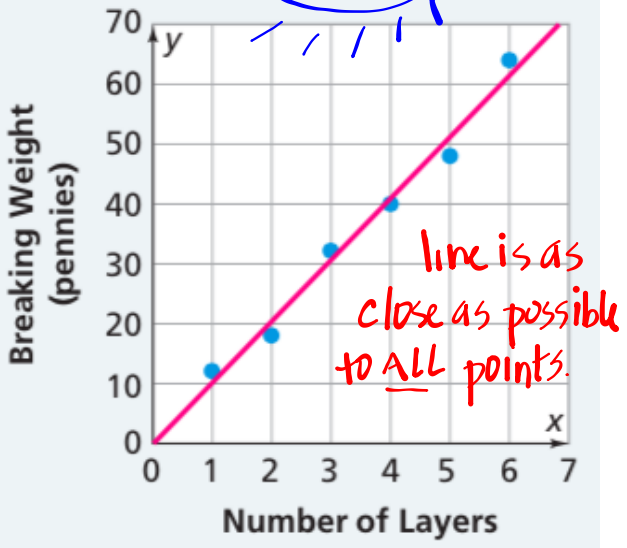
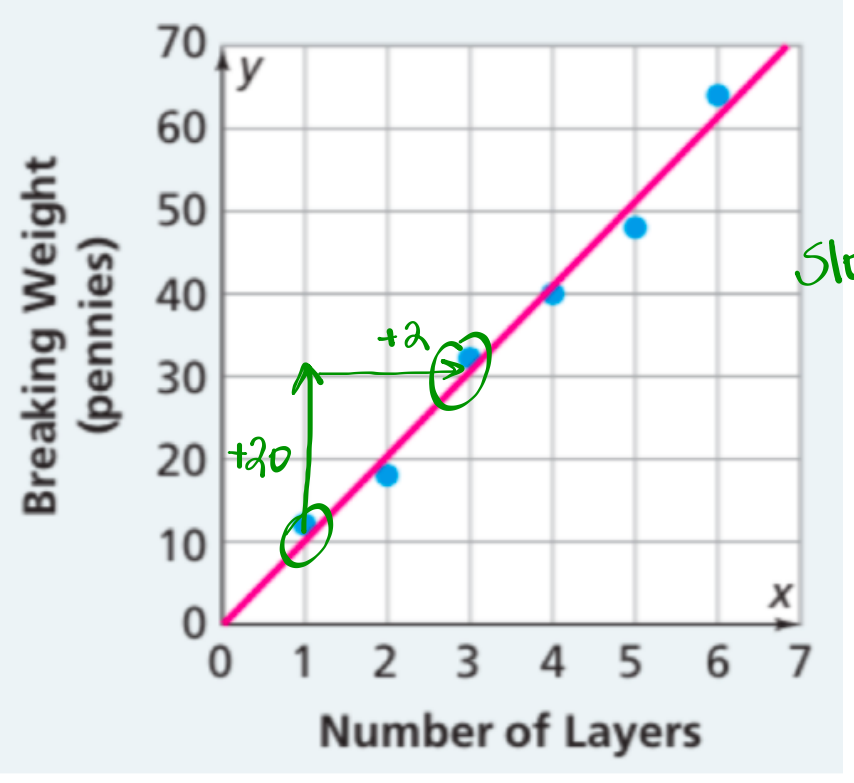


Figure 2



How do we write an equation from a line of best fit?



Slope = $\frac{\#\text{ pennies}}{\#\text{ of layers}}$

Slope = $\frac{\Delta y}{\Delta x} = \frac{20}{2} = 10$

$y = 10x + b$

$10 = 10(1) + b$

$10 = 10 + b$

$-10 \quad -10$

$0 = b$

To write the equation of the line, always choose points ON THE LINE (they don't need to be actual data points).

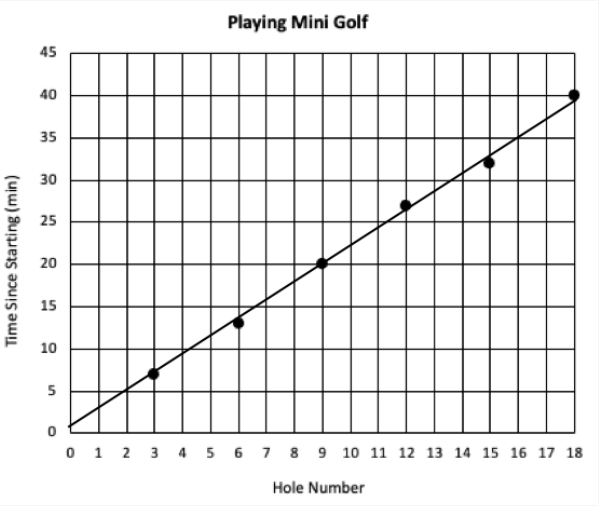
$y = 10x$

Using A Line of Best Fit to Make Estimates

Mini Golf:

Jamal and Alisha played a round of miniature golf. They made some notes of the time it took them to play. Their data are plotted in the graph below:

A line of best fit is already drawn. Pick 2 points on the line, and write the equation for the line of best fit in slope-intercept form (y = mx + b).



What is the slope of your line? What does this number tell us about playing mini golf?

The following questions can be answered using your equation.

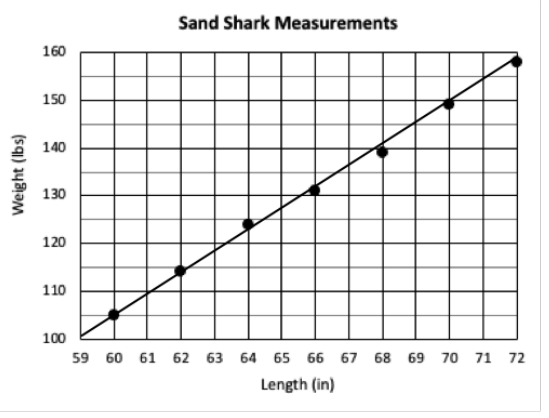
1. Estimate the time it took Jamal and Alisha to play the first 7 holes.

2. What hole would you estimate them to be on if they played for 35 minutes?

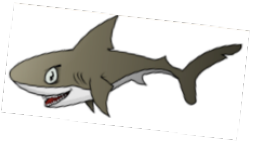
Sand Sharks:

Lengths and corresponding ideal weights of sand sharks were collected and the data is plotted below.

A line of best fit is already drawn. Pick 2 points on the line, and write the equation for the line of best fit in slope-intercept form (y = mx + b).



What is the slope of your line? What does this number tell us about the length and ideal weight for a sand shark?



The following questions can be answered using your equation.

1. Predict the weight of a sand shark whose length is 75 inches.

2. If a shark weighs 150 pounds, how long would we expect it to be?

Homework

Finish pages 1 and 2