

Name: Key
 Unit 11, Day 3 Warm-up

Date:
 Period:

1. The table shows the life expectancy of a person related to the year of birth.

Year of Birth, x	Life Expectancy in Years, y
1900	47.3
1910	50.0
1920	54.1
1930	59.7
1940	62.9
1950	68.2
1960	69.7

Which equation would give the best estimate of life expectancy, given the year of one's birth?

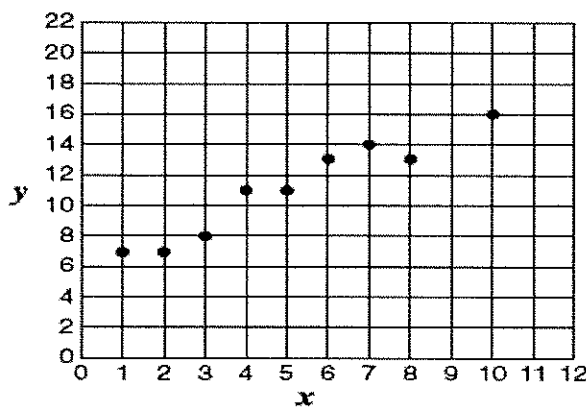
a. $y = 0.45x + 919$

b. $y = 0.45x - 819$

c. $y = 0.40x + 893$

d. $y = 0.40x - 716$

2.



Using the data plotted on the scatterplot, which equation most closely describes a line of best fit for the data?

F $y = x + 6$

~~N~~ $y = 2x - 4$

H $y = 2x + 5$

~~K~~ $y = 3x - 4$

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Unit 11, Day 3 Notes

Period:



Learning Targets

- I can make predictions from a line and curve of best fit.

Line of Best Fit - Predictions

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

Meal Cost (x)	\$4.75	\$6.84	\$12.52	\$20.42	\$8.97
Tip (y)	\$0.50	\$0.90	\$1.50	\$3.00	\$1.00

Line of Best Fit Equation $y = .16x - .299$

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

What variable are you given? x

What variable are you looking for? y

Plug in your information to line of best fit: $= .16(10.50) - .299$

Solve for the missing variable: $= \$1.38$

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

X <u>Study</u>	2	5	1	0	4	2	3
Y <u>Final</u>	77	92	70	63	90	75	84

Line of Best Fit Equation $y = 6.1x + 63.9$

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

What variable are you given? x

What variable are you looking for? y

Plug in your information to line of best fit: $6.1(6) + 63.9$

Solve for the missing variable: 100.5

3. The table below gives the height and shoe sizes of six randomly selected men.

Height	67	70	73.5	75	78	66
Shoe size	8.5	9.5	11	12	13	8

Line of Best Fit Equation $y = .42x - 19.8$

If a man has a shoe size of 10.5, what would be his predicted height?

What variable are you given? y

What variable are you looking for? x

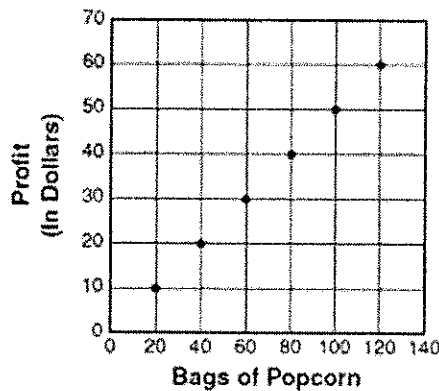
Plug in your information to line of best fit: $10.5 = .42x - 19.8$

Solve: $30.3 = .42x$

$x = 72.14$

4.

The graph represents the relationship between the bags of popcorn sold and the amount of profit made during the Newton Honor Society's popcorn sale.



Which is closest to the minimum number of bags that must be sold to make a \$200 profit?

- F 250
- G 300
- H 350
- J 400

half the value x

20, 10
 40, 20
 60, 30
 80, 40
 100, 50
 120, 60

Curve of Best Fit – Predictions

1. Given the data in the table below, using a curve of best fit when x is 5, what is y ?

x	y
0	0
1	66
2	100
3	102
4	72

What is the curve of best fit?

$$y = -16x^2 + 82x + 0$$

What variable are you given?

$$x = 5$$

What variable are you looking for?

$$y$$

Plug in your information to curve of best fit:

$$-16(5)^2 + 82(5) + 0$$

Solve for the missing variable:

$$y = 10$$

2. (-8, 80.4) (-7, 57.8) (-6, 38.6) (-5, 22.8) (3, 18.8) (5, 51.8) (7, 98.4)

Use the data above and a curve of best fit to find y when x is -10.

$$y = 1.7x^2 + 2.9x - 5.2$$

$$y = 1.7(10)^2 + 2.9(10) - 5.2$$

$$y = 135.8$$

3. When people slam their brakes on motorcycles, skid marks occur. A scientist clocked the speeds of the motorcycles and the length of the skid marks. The data is the table below. Using the equation of best fit, which is the best prediction of the length of a skid mark if the speed is 55 miles per hour?

Motorcycle Speed (mph)	25	30	35	40	45	50
Length of Skid (inches)	100	105	110	115	110	105

Is this a line of best fit or curve of best fit?

$$y = -.06x^2 + 5.1x + 12.1$$

What is the equation of line/curve of best fit?

What variable are you given? x

What variable are you looking for? y

Plug in your information to curve of best fit:

$$y = -.06(55)^2 + 5.1(55) + 12.1$$

Solve for the missing variable:

$$y = 111.1 \text{ inches}$$

4. A baseball player threw a ball up in the air. The height of the ball was recorded in .1-second intervals. The data is shown below. Based on a quadratic model, which best approximates the height at .8 seconds?

Time (seconds)	Height (feet)
0.0	5
0.1	7
0.2	9
0.3	11
0.4	18
0.5	23
0.6	16
0.7	13

Is this a line of best fit or curve of best fit?

What is the equation of line/curve of best fit?

$$y = -54.8x^2 + 56.2x + 2.7$$

What variable are you given? x

What variable are you looking for? y

Plug in your information to curve of best fit:

$$-54.8(.8)^2 + 56.2(.8) + 2.7$$

Solve for the missing variable:

$$12.59 \text{ ft}$$

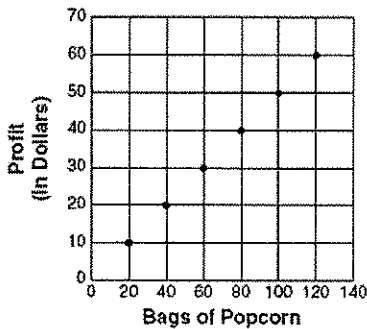
Makes sense!



Learning Targets

- I can make predictions from a line and curve of best fit.

1. The graph represents the relationship between the bags of popcorn sold and the amount of profit made during the Newton Honor Society's popcorn sale.



x	y
20	10
40	20
60	30
80	40
100	50
120	60

Which is closest to the minimum number of bags that must be sold to make a \$200 profit?

- a. 250 b. 300
c. 350 d. 400

2. Which equation defines the linear line of best fit for the data in the table?

x	y
70	4
75	7
80	8.5
85	12
90	11
95	13.5
100	15

- a. $y = 19.5x - 0.35$
b. $y = -0.35x + 19.5$
c. $y = -19.5x + 0.35$
d. $y = 0.35x - 19.5$

$$y = 4.4x - 156.14$$

$$= 4.4(75) - 156.14$$

$$= 173.86$$

3. The table below shows the lengths and corresponding ideal weights of sand sharks.

Length	60	62	64	66	68	70	72
Weight	105	114	124	131	139	149	158

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

4. This table shows the value, v , of an account at the end of m months. There was an initial deposit of \$50 and no other deposits were made.

M, time in months	V, value in dollars
0	50
1	129
3	299
5	485
7	687
9	905

If the value of the account continues to increase in the same way, predict the value of an account at the end of $x = 13$ months. Use the quadratic curve of best fit to make the prediction. *

$$y = 2x^2 + 77x + 50$$

$$= 2(13)^2 + 77(13) + 50$$

$$= 1,389$$

5. This set of ordered pairs shows a relationship between x and y .

$(-6, 88)$ $(-4, 32)$ $(-2, 0)$ $(-1, -7)$ $(0, -8)$ $(3, 25)$
 $(5, 77)$, $(6, 112)$

Using the quadratic curve of best fit, predict the value of y when $x=8$.

$$y = 3x^2 + 2x - 8$$

$$y = -3080$$

6. The table shows the clothing purchases Jenny made last month and the tax charged for each purchase.

Clothing Purchases (in dollars), c	Tax (in dollars), t
35	3.15
40	3.60
22	1.98
68	6.12
74	6.66
31	2.79

Which equation represents the line that best fits the data?

- a. $t = 0.09c + 2.89$
 b. $t = 0.91c$
 c. $t = 0.09c$
 d. $t = 1.09c$

7. A delivery service company maintains several vehicles. The table summarizes the cost for auto insurance related to the number of vehicles insured.

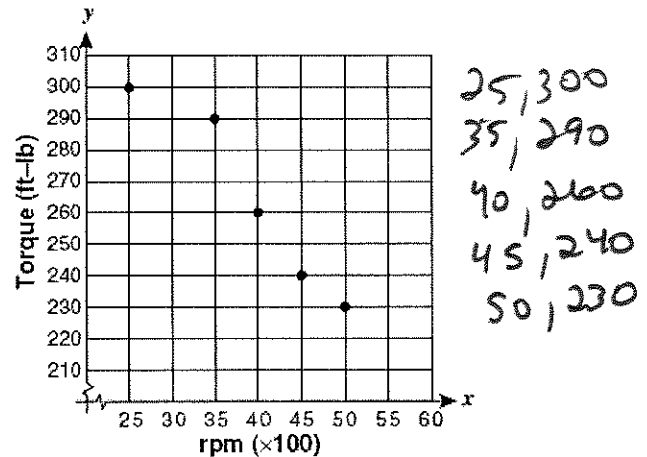
Number of Vehicles	Cost (\$)
1	1,700
2	2,200
3	2,700
4	3,200
5	3,700
6	4,200

Using the equation of a line of best fit for the data, which is the closest estimate of the total cost of insuring eight vehicles?

- a. \$5,050 c. \$5,500
 b. \$5,200 d. \$5,950

$$y = 500x + 1200$$

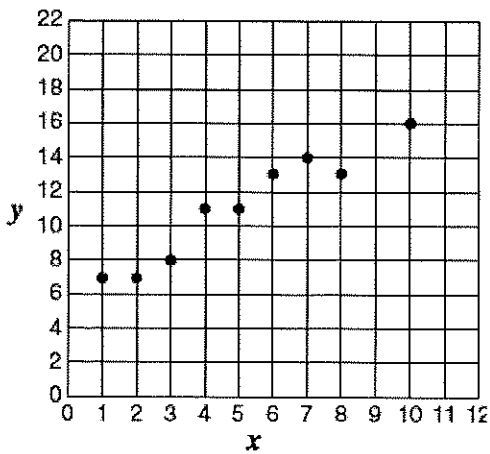
8. An engine is tested for torque output at different revolutions per minute.



Which equation most closely defines the line of best fit for the data?

- a. $y = 4.1x + 414$ b. $y = -4.1x + 414$
 c. $y = 3.1x + 383$ d. $y = -3.1x + 383$

9. Using the data plotted on the scatter plot, which equation most closely describes a line of best fit for the data?



- a. $y = x + 6$
 b. $y = 2x - 4$
 c. $y = 2x + 5$
 d. $y = 3x - 4$

Handwritten notes for question 9:
 1, 7 8, 13
 2, 7 10, 16
 3, 8
 4, 11
 5, 11
 6, 13
 7, 14

10. The table shows the relationship between a , the area of a rectangle, and h , its height, when the base remains constant.

h	2	5	7	12
a	8	20	28	48

Which equation represents the relationship between h and a ?

- a. $a = h + 6$
 b. $a = 3h + 2$
 c. $a = 4h$
 d. $a = 2h + 4$

11. The table below shows the relation between the number of members in a club selling cookies and the predicted number of boxes sold.

Club Cookie Sales

Number of Members, g	Number of Boxes Sold, b
5	350
10	650
15	950
20	1,250

Using the data shown above, which equation could be used to predict the number of boxes of cookies that the club will sell?

- a. $b = 60g$
 b. $b = 70g$
 c. $b = 60g + 50$
 d. $b = 50g + 50$

12. The numbers in the table follow a linear pattern.

x	y
2	14
4	26
6	38
8	50
28	170
30	?

Handwritten calculation for question 12:
 $y = 6x + 2$
 $= 6(30) + 2$
 $= 180 + 2$
 $= 182$

What is the missing y value?

- a. 182
 b. 180
 c. 176
 d. 172

Name: *Key*

Answers Vary

Date:

Unit 11, Day 3 Activity

Period:



Learning Targets

- I can make predictions from a line and curve of best fit.

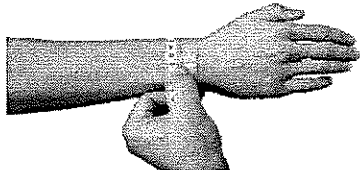
1. Measure the circumference of your **head** in centimeters. Round to the nearest whole number.

Your Head Circumference: _____



2. Measure the circumference of your **wrist** in centimeters. Round to the nearest whole number.

Your Wrist Circumference: _____



3. Record your information and the information from 4 friends.

Your data here →

Your friends' data here {

Head Circumference X	Wrist Circumference Y

4. How could you find the **line of best fit** for your data? Explain.

5. What is the **line of best fit** for your data? _____

6. Using your **line of best fit**, determine:

- a. What is the approximate **wrist size** of someone with a **head circumference of 58 centimeters**?

- b. What is the approximate **head size** of someone with a **wrist circumference of 16 centimeters**?

