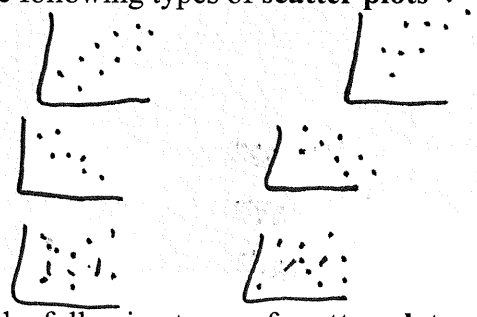
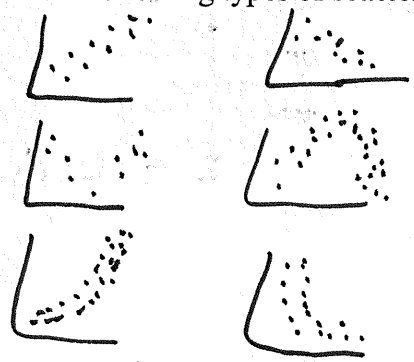
Unit 5 Assessment Review-Scatter Plots Name: Answer Key

ID.B.6: Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

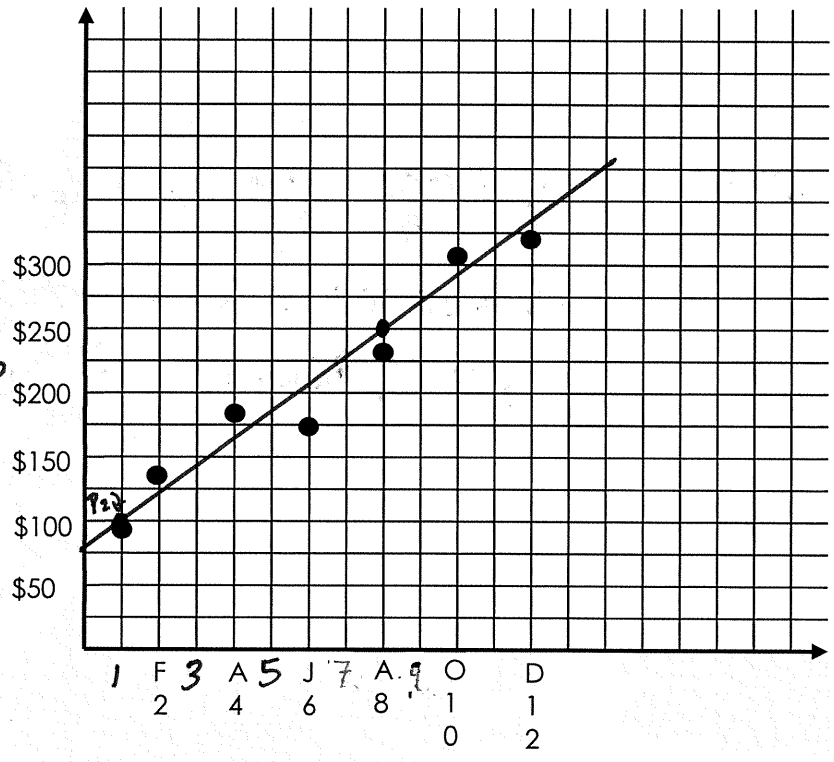
1. Draw 2 examples of each of the following types of **scatter plots**
   a. Positive
   b. Negative
   c. No correlation



2. Draw 2 examples of each of the following types of **scatter plots**
   a. Linear
   b. Quadratic
   c. Exponential



3. The graph at right represents the amount of money in Mrs. Johnson's savings account each month in 2015.



Hint: January is 1, F= February=2

a) For this data, draw the line of best fit.

b) Estimate the equation of the line of best fit: (8, 250) (1, 100)

$m = \frac{250-100}{8-1} = \frac{150}{7}$ $100 = \frac{150}{7}(1) + b$

$y = \frac{150}{7}x + 78.6$ $100 = 21.4 + b$ $-21.4 \quad -21.4$ $78.6 = b$

c) How much money would you say was in her account in May, 2015?

$x = 5$ 5 month

$y = \frac{150}{7}(5) + 78.6$

$y = 107.14 + 78.6$

$y = \$185.74$ in May

d) How much money would you estimate will be in her account in February, 2016?

Jan, Feb

$2015 = 12 + 2 = 14$

1yr

$x = 14$

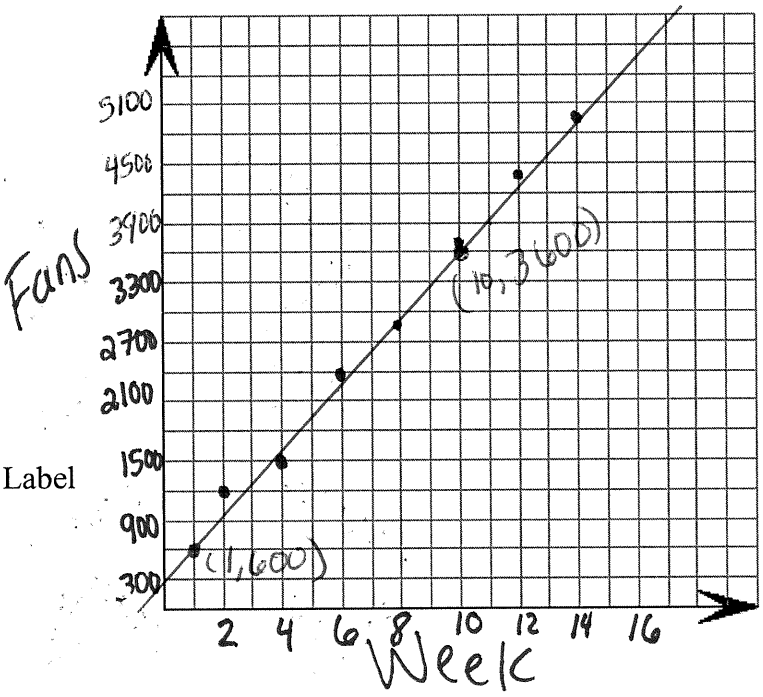
$y = \frac{150}{7}\left(\frac{14}{1}\right) + 78.6$

$y = 300 + 78.6$

$y = \$378.60$

4. The table below represents the number of people in a new band's fan club.

Week	Fans
2	1200
4	1500
6	2400
8	2900
10	3550
12	4400
14	5025



a) Graph the points on the axes at the right. Label both axes. (1,600) (10,3600)

b) For this data, draw the line of best fit.

c) Estimate the equation of the line of best fit:

$m = \frac{3600-600}{10-1} = \frac{3000}{9} = \frac{1000}{3}$

$y = mx + b$ $\quad 600 = \frac{1000}{3}(1) + b$

$-333.3 \quad -333.3$

$b = 266.67$

$y = \frac{1000}{3}x + 266.67$

(1, 600)
x y

d) How many fans would you predict after 30 weeks?

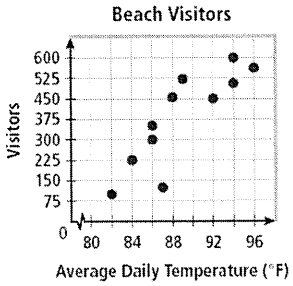
$x = 30$

$y = \frac{1000}{3}\left(\frac{30}{1}\right) + 266.67$

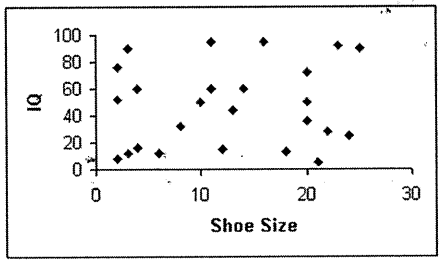
$y = 10000 + 266.67$

$y = 10,266.67 \approx$ 10,267 fans

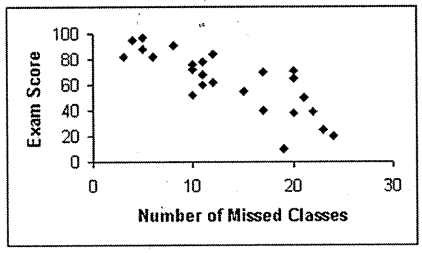
5. Label each of the following scatterplots as positive, negative, or no correlation.



pos.



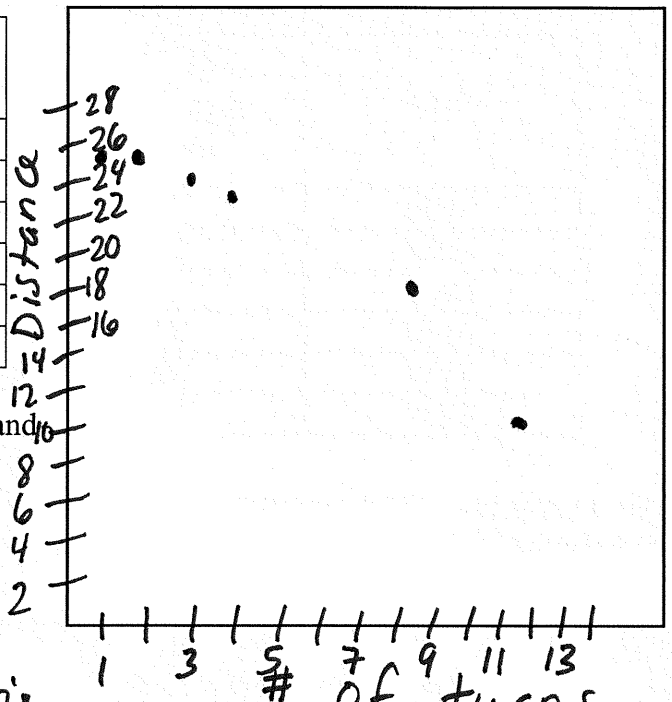
No



Neg.

6. The table below represents distance from the bolt to the nut per number of turns.

Number of Turns	Distance from Nut to Bolt Head (mm)
2	25
4	24
5	23
9	18
11	13
12	10



6a) Create a scatterplot. Draw your scatterplot below and label the scales on the axes.

6b) Describe the association of the scatterplot.

negative correlation
as the number of turns increases the distance decreases

6c) Use technology(desmos) to find the equation for the line of best fit and sketch the line on the graph above.

$m = -1.49497$

$b = 29.5473$

$y = -1.49497x + 29.5473$

6d) How well does this line fit the data?

$r = -.9748$

Strong negative correlation

6e) Interpret the slope and y-intercept in your equation.

The slope of -1.49 means that for every turn the bolt's distance decreases by 1.49 mm

The y-intercept of 29.55 means that the nut started 29.55 mm's away from the bolt head.

6f) Use your line of best fit equation to make a prediction. What would you expect the distance from the bolt to the nut to be at 30 turns? What does that say about the linear model for this data?

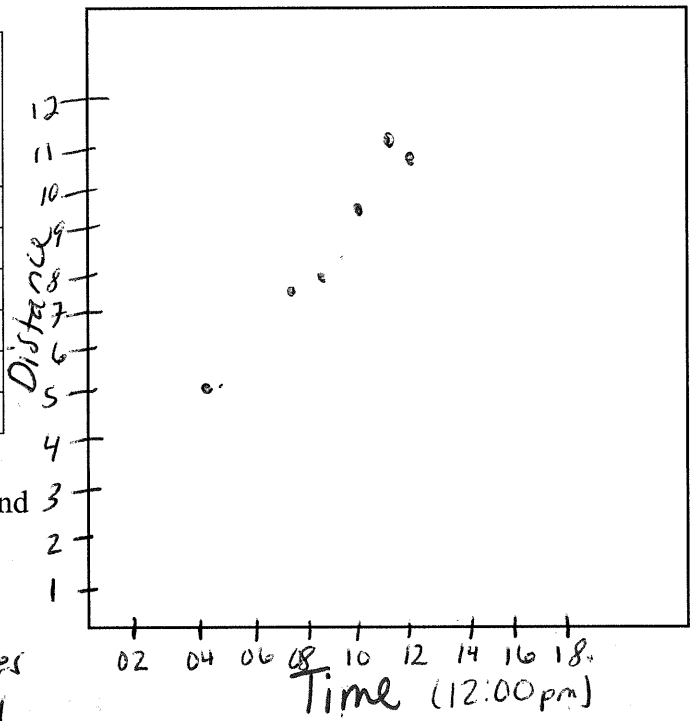
$x = 30$ $\quad y = -1.49497(30) + 29.5473$

$y = -15.30$ mm

that means the linear model only works up to a specific amount because distance can't be negative

7. The table below represents the distance of an automobile from Chi-Hi at lunchtime.

Time	Distance from Chi-Hi (miles)
12:06	5
12:08	7.5
12:09	8
12:10	9.5
12:11	11
12:12	10.5



7a) Create a scatterplot. Draw your scatterplot below and label the scales on the axes.

7b) Describe the association of the scatterplot.

positive, as time increases so does the distance from school

7c) Use technology to find the equation for the line of best fit and sketch the line on the graph above.

if mins only $m = 1$, $b = -.75$, $y = x - .75$ | if $12\frac{6}{60}$ etc. $m = 68.23$ $b = -820.602$

7d) How well does this line fit the data?

$r = .9718$ strong positive | $r = .9928$ strong positive | $y = 68.23x - 820.602$

7e) Interpret the slope and y-intercept in your equation.

The slope of 1 or 68.23 means that the distance increases 1 mile per min or increases 68.23 miles every hour.

The y-intercept of -.75 or -820.602 means that you started negative miles or in other words haven't left school yet at 12 p.m

7f) Use your line of best fit equation to make a prediction. What would you expect distance from Chi-Hi to be at 1:00? If we recorded data for the entire lunch period, how would you expect a linear model fit the data?

$x = 60$ min $y = 60 - .75$ $y = 59.25$ miles or $x = 13$ 1pm = 13 $y = 68.23(13) - 820.602$ $y = 66.388$ miles

7g) Suppose that the car travels 1.5 miles between 12:12 and 12:13. How would that data point change the line of best fit?

it would decrease the line of best fit

f) a linear model would not fit as well over lunch since students go far and then come back quadratic would make more sense dist.