Directions: Show all work to receive full credit.

Name **Answer Key**
Date _____ Per ___

S-ID.6 (2): *I can create and use a scatter plot. I can create best fit lines and use the residual to analyze the best-fit line.*

1. The scatter plot shows the number of CDs (in millions) that were sold from 1999 to 2005.
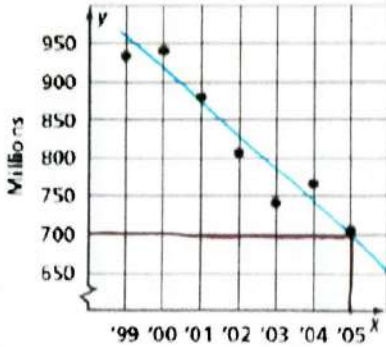
Part A: What type of function would best fit the graph?
- (A) Linear function
- (B) Quadratic function
- (C) Exponential function

Part B: Based on this relationship, **predict** what year it is if approximately 700 million CDs were purchased?
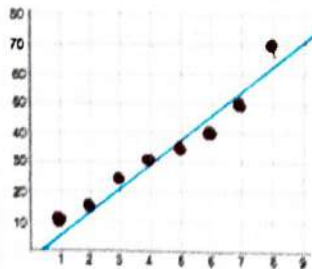
2005

Part C: If a linear function is used to model the relationship between dollars spent in technology and the year, which residual would you expect? **Circle One:**

Residual A ➔   Residual B
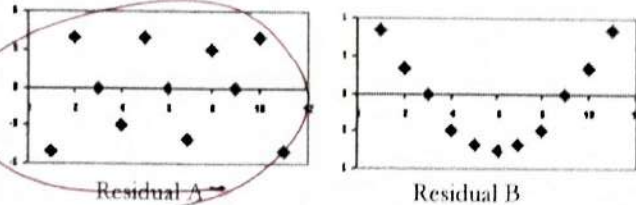
2. In the table, *x* represents the number of hours you have worked at a beauty salon and *y* represents the number of dollars you have made in tips.

x	1	2	3	4	5	6	7	8
y	10	15	25	30	35	40	50	70

Part A: Construct a scatter plot of the values in the table.

Part B: Draw the line of best fit for the points you graphed.

Part C: What type of correlation (if any) is there between hours worked and tips earned?

- ● Positive   ○ Negative   ○ No correlation

S-ID.7 (3): *I can write a linear function of a best fit line. I can interpret the slope and y-intercept of a linear model in the context of the data.*

3. What is the equation of the line of best fit you created in the scatter plot in problem #2?

Answer: $y = \dfrac{7.7}{A} x + \dfrac{-0.2}{B}$

Part B: What does the slope mean in this context?

"y" per "x"

tips   per # of hours

4. Tara creates a budget for her weekly expenses. The graph shows how much money is in the account at different times. Find the slope and y intercept of the line. Then explain what they mean in this real-world context.

negative = going down
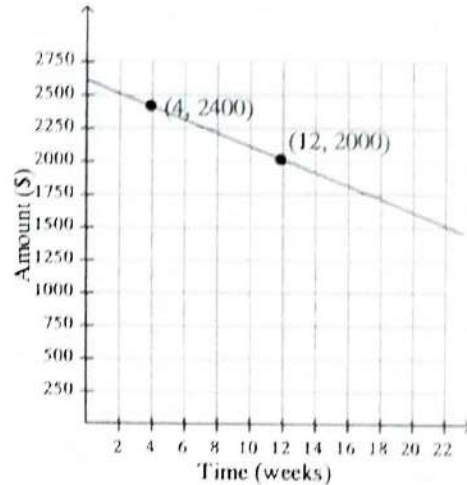
Part A: Interpret the meaning when given a slope of -50.
- (A) Tara receives $50.
- (B) Tara **earns** $50 each week.
- (C) Tara **spends** $50 each week.   "y" per "x"   Amount per week
- (D) Tara owes her friend $50.

Part B: Interpret the y-intercept of $2600   "starting point"
- (A) Tara spends $2600 each week.
- (B) Tara earns $2600 each week.
- (C) Tara started with $2600.
- (D) Tara owes her friend $2600.

5. You find a line of fit for a set of data and calculate that the correlation coefficient for the model is 0.7.
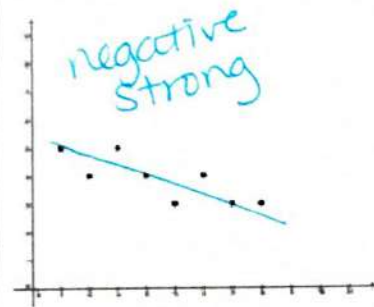
$r = 0.7$

Circle 3 of the choices below:

(Positive correlation)   OR   Negative correlation

(Strong correlation)   OR   Weak correlation

(Good fit for the data)   OR   Not a good fit for the data

$\pm .6, .7, .8, .9, 1 = $ strong
$\pm .4, .3, .2, .1 = $ weak

6. Find the approximate correlation coefficient for a linear model for the data.

negative strong

- (A) 0.8
- (B) 1
- (C) − 0.8
- (D) -1
- (E) 0
- (F) Cannot be

7. There is a known relationship between the age of a baby (in months) and the weight of the baby (in kg). Use a graphing calculator to find the correlation coefficient for a linear model.

Age (in months)	0	3	6	9	12	24
Weight (in kg)	3.3	6	7.8	9.2	10.2	12.3

★ calculator ★

Part A: Correlation Coefficient: $r = 0.9$

Part B: What does the correlation coefficient in this context tell you about your model? **Select all that apply.**

(Positive correlation)   OR   Negative correlation

(Strong correlation)   OR   Weak correlation

8 Which statement below might be caused by the statement, "When it rains...."?

- (A) it will be hotter outside.
- (B) more puddles will form on the ground.
- (C) the plants die.
- (D) the house becomes warmer.

9. The table below shows the prices of small popcorn and a small soda at eight different movie theaters.

Price of Small Popcorn	$4.50	$4.75	$5.00	$6.50	$4.50	$7.50	$5.00	$5.25
Price of Small Soda	$2.50	$3.00	$3.25	$4.00	$2.75	$3.50	$3.00	$3.50

Part A: Using the correlation coefficient, determine if there is a correlation between the cost of the popcorn and the cost of the soda. ★ calculator ★

$r =$ $r = 0.75$ OR $r = 0.8$

Is it a correlation?   ● YES   ○ NO

Explain how you know:

It is a correlation because 0.8 is strong, so it's a good fit for the data.

Part B: Is there a cause-and-effect between the cost of the popcorn and the cost of the soda? Explain.

Does the cost of the popcorn **cause** the cost of the soda

○ YES   ● NO

Explain your reasoning:

The prices are random & cannot directly cause the other price.