1   A study compared the number of years of education a person received and that person's average yearly salary. It was determined that the relationship between these two quantities was linear and the correlation coefficient was 0.91. Which conclusion can be made based on the findings of this study?
1)   There was a weak relationship.
2)   There was a strong relationship.
3)   There was no relationship.
4)   There was an unpredictable relationship.

2   The relationship of a woman's shoe size and length of a woman's foot, in inches, is given in the accompanying table.

Woman's Shoe Size	5	6	7	8
Foot Length (in)	9.00	9.25	9.50	9.75

The linear correlation coefficient for this relationship is
1)   1
2) -1
3)   0.5
4)   0

3   As shown in the table below, a person's target heart rate during exercise changes as the person gets older.

Age (years)	Target Heart Rate (beats per minute)
20	135
25	132
30	129
35	125
40	122
45	119
50	115

Which value represents the linear correlation coefficient, rounded to the *nearest thousandth*, between a person's age, in years, and that person's target heart rate, in beats per minute?
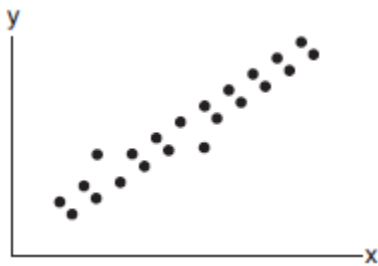1) -0.999
2) -0.664
3)   0.998
4)   1.503

4. What is the correlation coefficient of the linear fit of the data shown below, to the *nearest hundredth*?
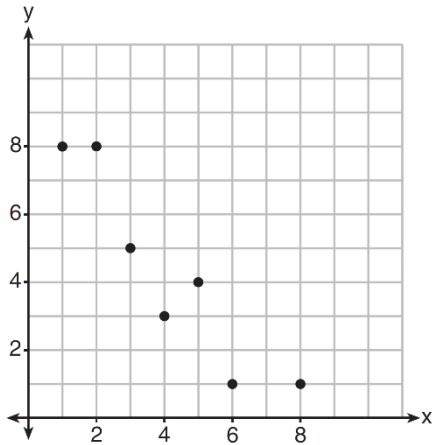
   1) 1.00
   2) 0.93
   3) −0.93
   4) −1.00

5 What could be the approximate value of the correlation coefficient for the accompanying scatter plot?

   1) −0.85
   2) −0.16
   3) 0.21
   4) 0.90

6   The points in the scatter plot below represent the ages of automobiles and their values. Based on this scatter plot, it would be reasonable to conclude:

   1) Age and value have a coefficient of correlation that is less than zero.
   2) Age and value have a coefficient of correlation that is equal to zero.
   3) Age and value have a coefficient of correlation that is between zero and 0.5.
   4) Age and value have a coefficient of correlation that is greater than 0.5.

7 Which value of *r* represents data with a strong negative linear correlation between two variables?
   1) −1.07
   2) −0.89
   3) −0.14
   4) 0.92

8 Which value of *r* represents data with a strong positive linear correlation between two variables?
   1) 0.89
   2) 0.34
   3) 1.04
   4) 0.01

9 The relationship between t, a student's test scores, and d, the student's success in college, is modeled by the equation $d = 0.48t + 75.2$. Based on this linear regression model, the correlation coefficient could be
   1) between -1 and 0
   2) between 0 and 1
   3) equal to -1
   4) equal to 0

10 A linear regression equation of best fit between a student's attendance and the degree of success in school is $h = 0.5x + 68.5$. The correlation coefficient, r, for these data would be
   1) $0 < r < 1$
   2) $-1 < r < 0$
   3) $r = 0$
   4) $r = -1$

11 Which calculator output shows the strongest linear relationship between x and y?
   1) Lin Reg
       $y = a + bx$
       $a = 59.026$
       $b = 6.767$
       $r = .8643$
   2) Lin Reg
       $y = a + bx$
       $a = .7$
       $b = 24.2$
       $r = .8361$
   3) Lin Reg
       $y = a + bx$
       $a = 2.45$
       $b = .95$
       $r = .6022$
   4) Lin Reg
       $y = a + bx$
 $a = -2.9$
       $b = 24.1$
       $r = -.8924$

12 Which graph represents data used in a linear regression that produces a correlation coefficient closest to -1?
   1)
   2)
   3)
   4)
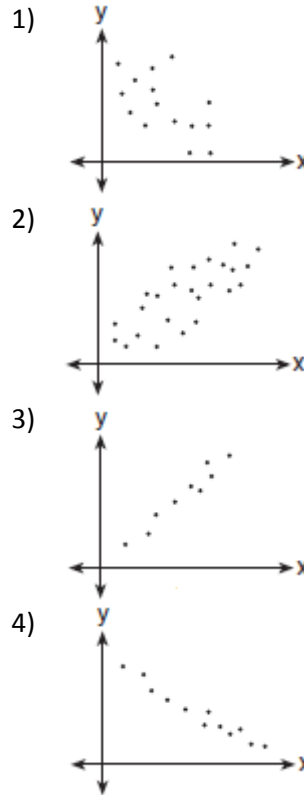
13 Which scatter diagram shows the strongest positive correlation?

1)

2)

3)

4)
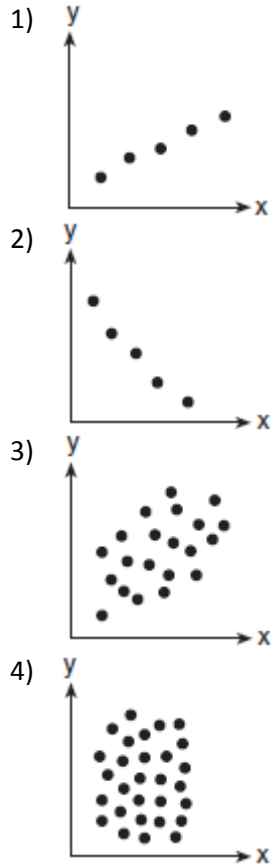
14 In the physics lab, Thelma determined the kinetic energy, *KE*, of an object at various velocities, *V*, and found the linear correlation coefficient between *KE* and V to be +0.8. Which graph shows this relationship?

1)

2)

3)

4)
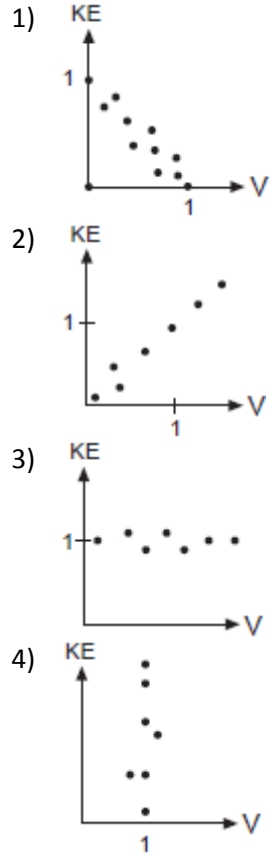
15 Determine which set of data given below has the stronger linear relationship between *x* and *y*. Justify your choice.

Set A

x	1	2	3	4	5	6
y	24	30	36	51	70	86

Set B

| x	1	2	3	4	5	6
y	81	64	49	36	25	16

16   A nutritionist collected information about different brands of beef hot dogs. She made a table showing the number of Calories and the amount of sodium in each hot dog.

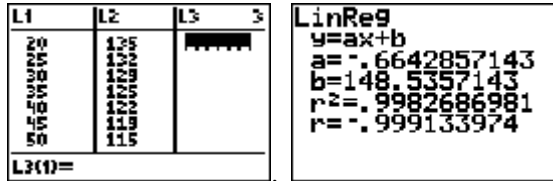| Calories per Beef Hot Dog	Milligrams of Sodium per Beef Hot Dog
186	495
181	477
176	425
149	322
184	482
190	587
158	370
139	322

a) Write the correlation coefficient for the line of best fit. Round your answer to the *nearest hundredth.*

b) Explain what the correlation coefficient suggests in the context of this problem.

HIGH SCHOOL
M A T H   T E A C H E R S

1   2

2   1
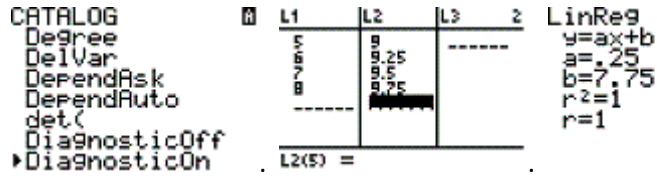
3   1

4   3

5   4; The correlation coefficient for the plot must be positive, eliminating answers (1) and (2). The correlation is rather strong, so the correlation coefficient should be closer to 1.

6   The correlation coefficient for the plot must be negative.

7   2

8   1

9   2 Since the coefficient of t is greater than 0, $r > 0$.

10   Because the slope of the linear regression equation of best fit is positive (0.5), the correlation coefficient must be positive.

11   (4) shows the strongest linear relationship, but if $r < 0$, $b < 0$. The Regents announced that a correct solution was not provided for this question and all students should be awarded credit.

12   If the correlation coefficient (r) is negative, the line of best fit must have a negative slope, eliminating answers (2) and (3). The nearer r is to -1, the more closely the data cluster around the line of best fit. Answer (4) has a tighter fit than answer (1).

13   Answer (2) has a negative correlation. Answer (4) has no correlation. The closer the data cluster around the line of best fit, the stronger the correlation. Answer (1) has a tighter fit than answer (3).

14   (2) is the only graph that shows a positive correlation.

15   $r_A \approx 0.976$ $r_B \approx 0.994$ Set B has the stronger linear relationship since r is higher.

16   $r \approx 0.94$. The correlation coefficient suggests that as calories increase, so does sodium.