A2.S.8: Correlation Coefficient: Interpret within the linear regression model the value of the correlation coefficient as a measure of the strength of the relationship

1 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

2 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

3 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
$y = a + bx$
$a = .7$
$b = 24.2$
$r = .8361$

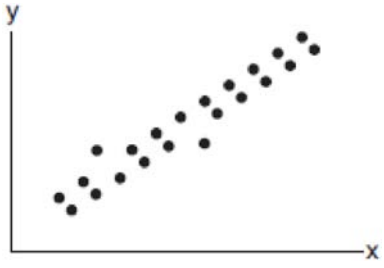
3) Lin Reg
$y = a + bx$
$a = 2.45$
$b = .95$
$r = .6022$

4) Lin Reg
$y = a + bx$
$a = -2.9$
$b = 24.1$
$r = -.8924$

4 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:

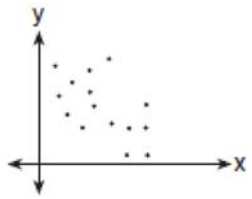
1) Age and value have a coefficient of correlation that is less than zero.
2) Age and value have a coefficient of correlation that is equal to zero.
3) Age and value have a coefficient of correlation that is between zero and 0.5.
4) Age and value have a coefficient of correlation that is greater than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

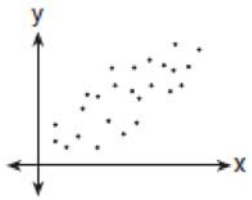
5 What could be the approximate value of the correlation coefficient for the accompanying scatter plot?

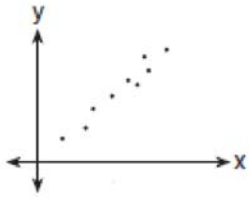


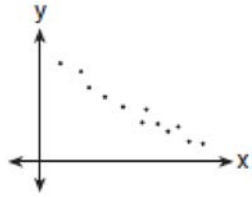
1) −0.85
2) −0.16
3) 0.21
4) 0.90

6 Which graph represents data used in a linear regression that produces a correlation coefficient closest to −1?

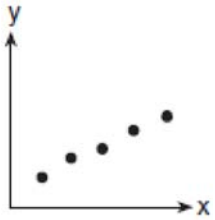
1) 

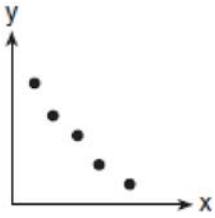
2) 

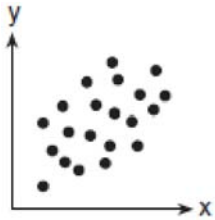
3) 

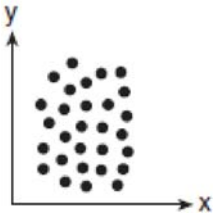
4) 

7 Which scatter diagram shows the strongest positive correlation?

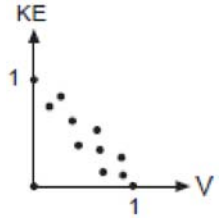
1) 

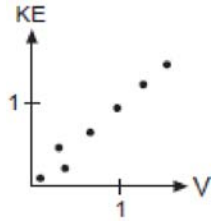
2) 

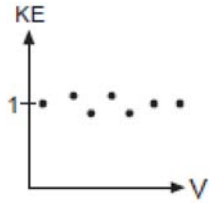
3) 

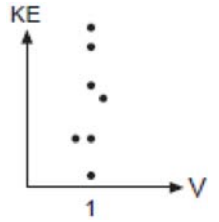
4) 

8 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) 

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 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

12 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

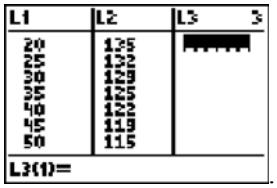
Which value represents the linear correlation coefficient, rounded to the *nearest thousandth*, between a person's age, in years, and that person's target heart rate, in beats per minute?
1) −0.999
2) −0.664
3) 0.998
4) 1.503

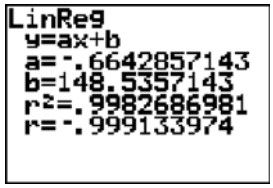
A2.S.8: Correlation Coefficient: Interpret within the linear regression model the value of the correlation coefficient as a measure of the strength of the relationship
Answer Section

1 ANS: 1 REF: 061316a2
2 ANS: 2 REF: 061021a2
3 ANS: 1
(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.

REF: 011223a2
4 ANS: 1 REF: fall9910b
5 ANS: 4 REF: 060705b
6 ANS: 4 REF: 080306b
7 ANS: 1 REF: 010515b
8 ANS: 2 REF: 010816b
9 ANS: 2
Since the coefficient of t is greater than 0, $r > 0$.

REF: 011303a2
10 ANS: 1 REF: 060211b
11 ANS: 1 REF: 060109b
12 ANS: 1





REF: 061225a2