Name:_____ **HW#_____** Date:_____

Review for Unit 4B Test-Statistics

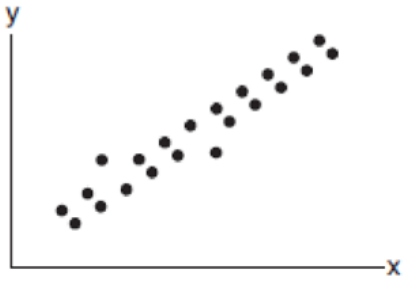
1. What could be the approximate value of the correlation coefficient for the accompanying scatter plot?

1) −0.85

2) −0.16

3) 0.21

4) 0.90



2. Which situation describes a negative correlation?

(1) the amount of gas left in a car's tank and the amount of gas used from it

(2) the number of gallons of gas purchased and the amount paid for the gas

(3) the size of a car's gas tank and the number of gallons it holds

(4) the number of miles driven and the amount of gas used

3. Which relationship can best be described as causal?

1) height and intelligence

2) shoe size and running speed

3) number of correct answers on a test and test score

4) number of students in a class and number of students with brown hair

4. Which correlation shows the weakest linear relationship between the variables?

1) -.99
2) -.42
3) .13
4) .84

Explain:_____

_____

5. 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.

6. Which of the following does not describe a causal relationship?

1) The faster the runner's pace, the quicker he will finish the race.

2) The rooster crows, the sun rises.

3) The more miles driven, the more gas will be used

4) The more powerful the microwave, the faster the food cooks.

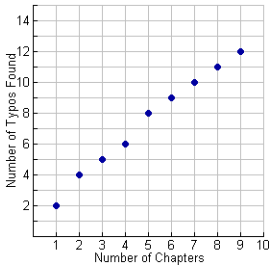
7. If you were asked to interpolate information from this graph, you would have to be careful to limit the number of chapters:

(1) between 2 and 8 chapters

(2) between 1 and 9 chapters

(3) chapters 2, 4, 6, and 8 only

(4) there is no need to limit chapters



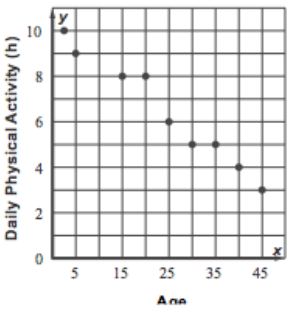
8. Which of the following is a reasonable estimate for the daily amount of physical activity for a person who is 50 years old?

1) 6 h

2) 5 h

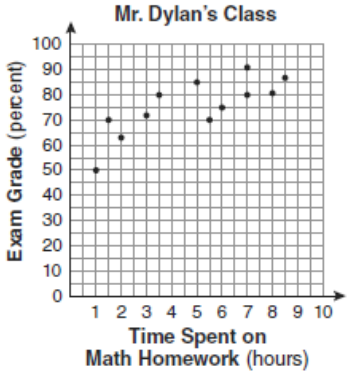
3) 4 h

4) 2 h



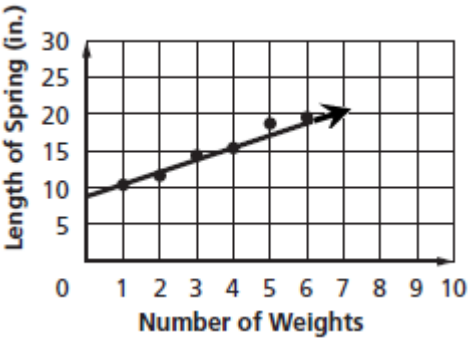
9. The number of hours spent on math homework each week and the final exam grades for twelve students in Mr. Dylan's algebra class are plotted below. Based on a line of best fit, which exam grade is the best prediction for a student who spends about 4 hours on math homework each week?

1) 62
2) 72
3) 82
4) 92



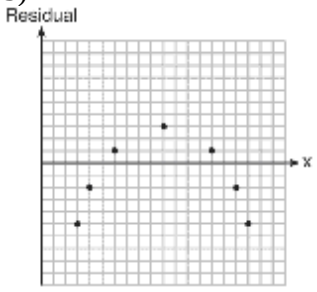
10. Which of the following is the most reasonable estimate for the length of a spring when 20 weights are attached?

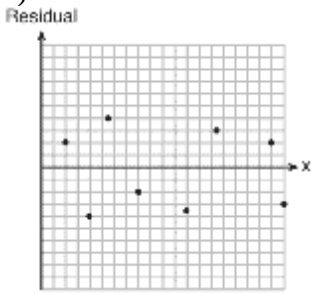
1) 25 in.
2) 39 in.
3) 54 in.
4) 62 in.



11. Which statistic would indicate that a linear function would *not* be a good fit to model a data set?

1) $r = -0.93$
2) $r = 1$

3)


4)


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

13. A negative correlation always exists on a scatter plot when

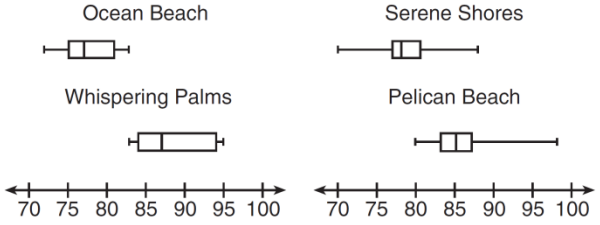
1) *y* remains unchanged as *x* increases
2) *y* changes randomly as *x* increases
3) *y* decreases as *x* increases
4) *y* increases as *x* increases

14. Which of the following statements are true?

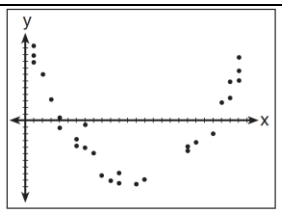
A. When the sum of the residuals is greater than zero, the data set is non-linear.
B. A random pattern on residuals supports a linear model.
C. A random pattern on residuals supports an exponential model.
D. A random pattern on residuals supports a quadratic model.

15. Corinne is planning a beach vacation in July and is analyzing the daily high temperatures for her potential destination. She would like to choose a destination with a high median temperature and a small interquartile range. She constructed box plots shown in the diagram below. Which destination has the largest interquartile range?

1) Ocean Beach
2) Whispering Palms
3) Serene Shores
4) Pelican Beach

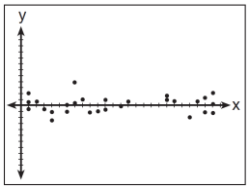


16. Directions: Given each the diagrams below. (a) indicate whether the values would be better represented by a linear or non-linear relationship. (b) Explain your answer.



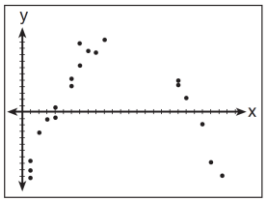
a)_____

b)_____



a)_____

b)_____



a)_____

b)_____

17. The table shows study times of 8 students and their related test scores.

Study Time (min)	Test Score
19	66
24	65
26	70
32	73
34	71
39	74
44	75
46	80

a) Find the best trend line (line of best fit), rounding values to the nearest *hundredth*.

b) Using the equation you found in part a, predict how many minutes a student has to study to receive a grade of 84. Round to the nearest whole number.

c) Using the equation you found in part a, predict the test score of a student who studied for 90 minutes. Round to the nearest whole number.

d) Were you interpolating or extrapolating data for part (c) ? Explain.

e) Does this data have a causal relationship? Explain.

18. The table to the right is data collected from Ms. Cronin & Ms. Rohr's class.

Score	Frequency
96	2
92	5
88	3
84	2
78	4
60	1

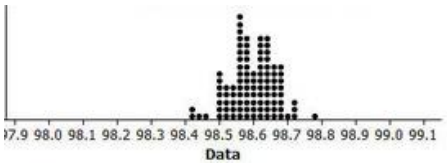
a. Find the mean to the *nearest tenth* _____

b. What is the standard deviation to the *nearest tenth*:_____

c. What is the range:_____

19. Without performing any calculations, which graph has the **highest** standard deviation? Explain your response

A



B

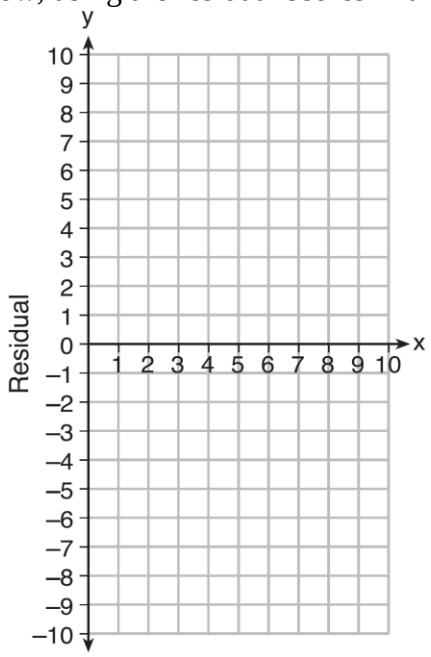
Explain:_____

20. Use the data below to write the regression equation ($y = ax + b$) for the raw test score based on the hours tutored. Round all values to the *nearest hundredth*.

Tutor Hours, x	Raw Test Score	Residual (Actual – Predicted)
1	30	1.3
2	37	1.9
3	35	–6.4
4	47	–0.7
5	56	2.0
6	67	6.6
7	62	–4.7

a) Equation: _____

b) Create a residual plot on the axes below, using the residual scores in the table above.



c) Based on the residual plot, state whether the equation is a good fit for the data. Explain your answer.