

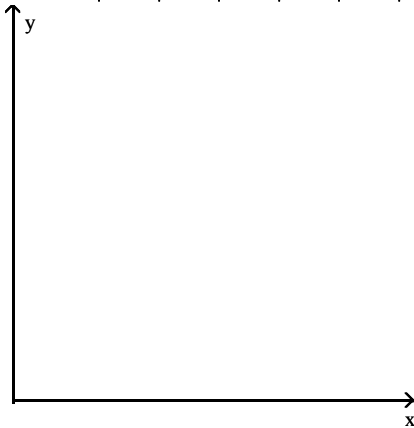
**Solutions are included at the end of the worksheet. This worksheet is optional and will not be turned in, but may be helpful in reviewing material and studying for exams.**

- 1) A contingency table relates
  - A) a particular response with order in which that response should be applied.
  - B) only continuous random variables.
  - C) the difference in the means of two random variables.
  - D) two categories of data.

- 2) Construct a scatter diagram for the data.

The data below are the final exam scores of 10 randomly selected history students and the number of hours they studied for the exam.

Hours, $x$	3	5	2	8	2	4	4	5	6	3
Scores, $y$	65	80	60	88	66	78	85	90	90	71



- 3) Find the equation of the regression line for the given data.

$x$	-5	-3	4	1	-1	-2	0	2	3	-4
$y$	-10	-8	9	1	-2	-6	-1	3	6	-8

- 4) The data below are the final exam scores of 10 randomly selected history students and the number of hours they slept the night before the exam. Find the equation of the regression line for the given data. What would be the predicted score for a history student who slept 7 hours the previous night? Is this a reasonable question? Round your answer to the nearest whole number.

Hours, $x$	3	5	2	8	2	4	4	5	6	3
Scores, $y$	65	80	60	88	66	78	85	90	90	71

5) The following data represent the living situation of newlyweds in a large metropolitan area and their annual household income. Find the marginal frequency for newlyweds who own their own home.

	< \$20,000	\$20-35,000	\$35-50,000	\$50-75,000	> \$75,000
Own home	31	52	202	355	524
Rent home	67	66	52	23	11
Live w/family	89	69	30	4	2

6) A traffic officer is compiling information about the relationship between the hour or the day and the speed over the limit at which the motorist is ticketed. He computes a correlation coefficient of 0.12. What does this tell the officer?

- A) There is insufficient evidence to make any conclusions about the relationship between the variables.
- B) There is a moderate negative linear correlation.
- C) There is a weak positive linear correlation.
- D) There is a moderate positive linear correlation.

7) A random sample of 200 men aged between 20 and 60 was selected from a certain city. The linear correlation coefficient between income and blood pressure was found to be  $r = 0.807$ . What does this imply? Does this suggest that if a man gets a salary raise his blood pressure is likely to rise? Why or why not? What are likely lurking variables?

8) Calculate the linear correlation coefficient for the data below.

x	0	2	9	6	4	3	5	7	8	1
y	-13	-11	6	-2	-5	-9	-4	0	3	-11

9) In an area of Russia, records were kept on the relationship between the rainfall (in inches) and the yield of wheat (bushels per acre). The data for a 9 year period is as follows:

Rain Fall, x	13.1	11.4	16.0	15.1	21.4	12.9	9.6	18.2	18.6
Yield, y	48.5	44.2	56.8	80.4	47.2	29.9	74.0	74.0	76.8

The equation of the line of least squares is given as  $\hat{y} = -9.12 + 4.38x$ . How many bushels of wheat per acre can be predicted if it is expected that there will be 30 inches of rain?

- 10) The \_\_\_\_\_ variable is the variable whose value can be explained by the \_\_\_\_\_ variable.
- A) response; predictor
  - B) lurking; response
  - C) response; lurking
  - D) predictor Response

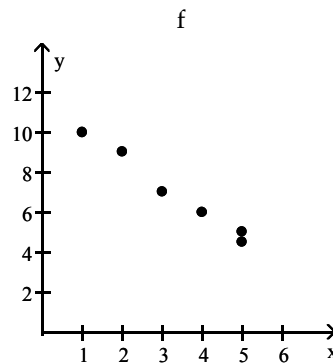
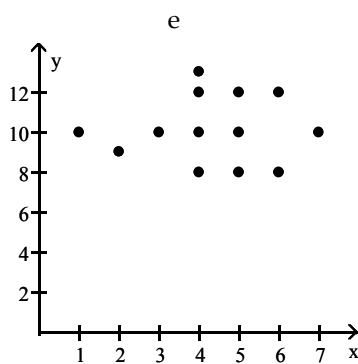
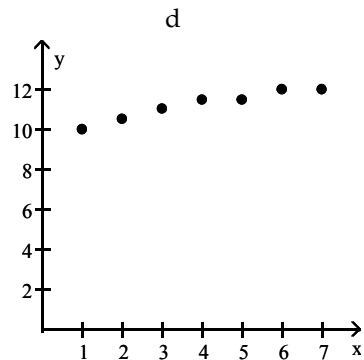
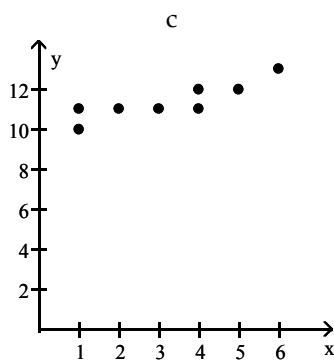
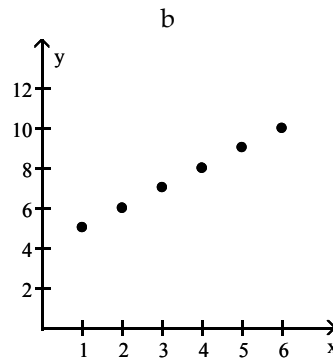
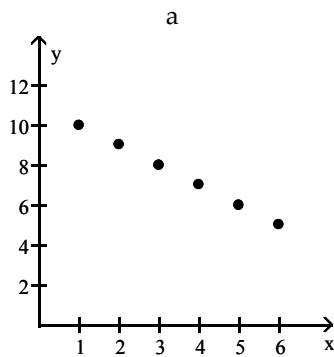
11) Compute the linear correlation coefficient between the two variables and determine whether a linear relation exists.

To investigate the relationship between yield of soybeans and the amount of fertilizer used, a researcher divides a field into eight plots of equal size and applies a different amount of fertilizer to each plot. The table shows the yield of soybeans and the amount of fertilizer used for each plot.

Amount of fertilizer (pounds), $x$	1	1.5	2	2.5	3	3.5	4	4.5
Yield of soybeans (pounds), $y$	25	21	27	28	36	35	32	34

- A)  $r = 0.819$ ; linear relation exists  
 B)  $r = 0.683$ ; linear relation exists  
 C)  $r = 0.729$ ; no linear relation exists  
 D)  $r = 0.683$ ; no linear relation exists

12) In which scatter diagram is  $r = 0.01$ ?

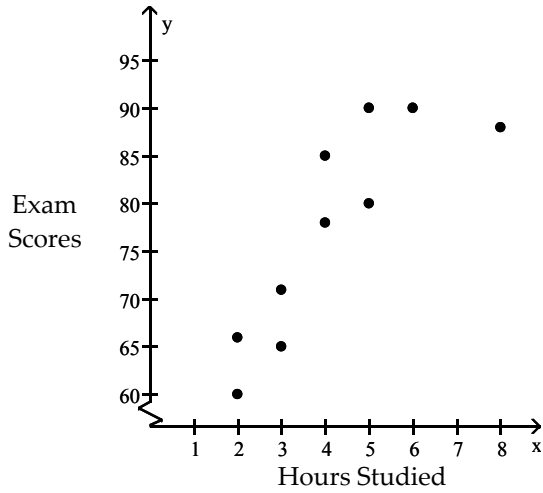


Answer Key

Testname: MATH 1040 WORKSHEET 4

1) D

2)



3)  $\hat{y} = 2.097x - 0.552$

4)  $\hat{y} = 5.044x + 56.11$ ; 91; Yes, it is reasonable.

5) 1164

6) C

7) A positive correlation exists between income and blood pressure but this is an example of correlation not causation. An increase in salary is unlikely to lead to an increase in blood pressure. Age and level of job stress are possible lurking variables and these lurking variables account for the positive correlation. Older men tend to have both higher blood pressures and higher incomes. Also men in high stress jobs tend to have both higher blood pressures and higher incomes.

8) 0.990

9) Cannot be certain of the result because 30 inches of rain exceeds the observed data.

10) A

11) A

12) e