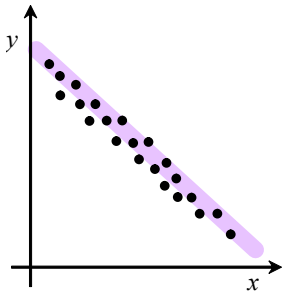
Statistics Review Worksheet

1 The following scatter plot represents a two-variable statistical distribution. **Which of the following statements about this distribution is true**?



A) The linear correlation is weak, and the two variables vary in the same direction.

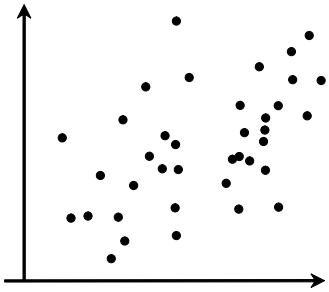
B) The linear correlation is weak, and the two variables vary in opposite directions.

C) The linear correlation is strong, and the two variables vary in the same direction.

D) The linear correlation is strong, and the two variables vary in opposite directions.

as one increases the other decreases

2 Consider the scatter plot shown here.
Which of the following best describes its correlation coefficient?



A) Positive and strong

B) Positive and weak

C) Negative and strong

D) Negative and weak

3 The following are correlation coefficients: 0.2, −0.92, 0.85, −0.45
Which best represents these correlation coefficients arranged from strongest degree of correlation to weakest?

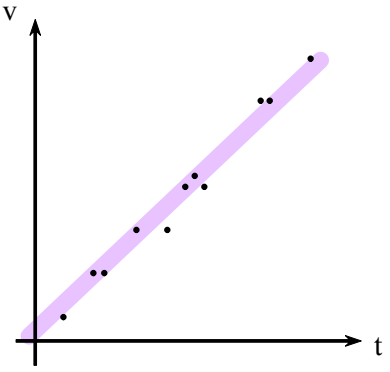
A) −0.92, −0.45, 0.2, 0.85

B) 0.85, 0.2, −0.45, −0.92

C) −0.92, 0.85, −0.45, 0.2

D) 0.2, −0.45, 0.85, −0.92

4 Physics students conducted an experiment to determine the relationship between the velocity (v) of a free-falling object and the time (t) elapsed since its release. The scatter plot of the experimental data obtained is illustrated here. **Which one of the following values is the best approximation of the correlation coefficient between these two variables**?



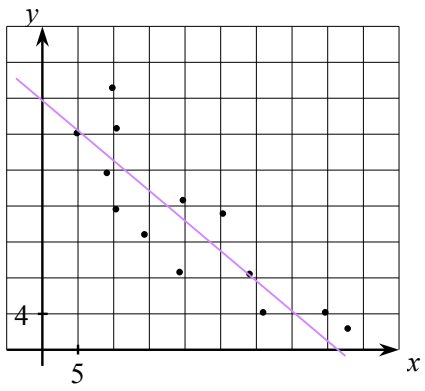
A) 0.9

B) -0.9

C) 0.1

D) -0.1

5 Given this scatter plot:



Which of the following equations most resembles the equation of the regression line?

check potential y-intercept of regression line closer to 27 than 41

A) $y = \frac{-2}{3}x + 27$

B) $y = \frac{-2}{3}x + 41$

C) $y = \frac{2}{3}x + 27$

D) $y = \frac{2}{3}x + 41$

6 In 1996, a study was conducted on the relationship between the annual payrolls of major league baseball teams and the number of wins each recorded in a given season. The number of wins for the teams with the nine highest payrolls is listed in the table below.

93.75−84.8 / 54−42.2 = .76

Teams	Payroll (in millions of $)	Number of wins
New York Yankees	61	92
Baltimore Orioles	55	88
Atlanta Braves	53	96
Cleveland Indians	47	99
Chicago White Sox	44	85
Cincinnati Reds	43	81
Seattle Mariners	43	85
Texas Rangers	41	90
Colorado Rockies	40	83

x1 = 54, x2 = 42.2, y1 = 93.75, y2 = 84.8

How many games could a team with a payroll of 30 million dollars expect to win?

$y = .76x + 52.71$ ANSWER = ≈ 76 games

7 The life expectancy of males has changed greatly during the last century. The table below summarizes these changes.

Year of birth	1920	1925	1930	1935	1940	1945	1950	1955	1960	1965	1970	1975	1980	1985	1990
Male life expectancy	54	56	58	59	61	63	66	67	67	67	68	69	70	71	72

Using your knowledge of statistics, extrapolate the year in which males will first expect to live to 100 years of age.

see next page →

mean points

- (1935, 59.57)
- (1972.5, 68.675)

slope: $\frac{68.675 - 59.57}{1972.5 - 1935} = \frac{9.105}{37.5} = .2428$

$y = .24x + b$

$59.57 = .24(1935) + b$

$b = -404.83$

$y = .24x - 404.83$

let $y = 100$

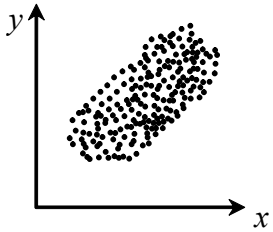
$100 = .24x - 404.83$

$x = 2103.46$

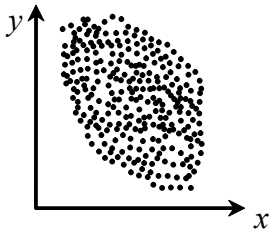
8 Match each scatter plot on the left with its correlation coefficient on the right.

Scatter Plot | **Correlation Coefficient**

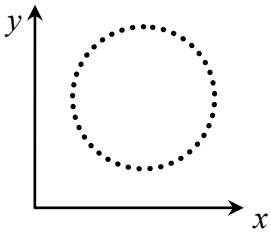
a)



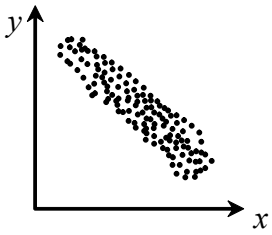
b)



c)



d)



① 1
② -0.9
③ 0.7
④ -0.5
⑤ 0

• obviously not linear

9 A high school physics class investigated the relationship between the force applied to a spring and the extension in the length of the spring. The table displays some of the results produced by the students.

Force (N)	Extension (cm)
2.5	5.4
2.75	6.8
3.0	7.5
3.25	8.2
3.50	8.34
3.75	8.5
4.0	10.2
4.25	10.24

One of the students in the class predicted the spring would have an extension of approximately 15.54 cm if a force of 6.25 N would be applied to the spring.

Is this prediction consistent with the data collected by the rest of the class? Justify your answer using appropriate statistical analysis.

(2.875, 6.975) mean points
(3.875, 9.32)

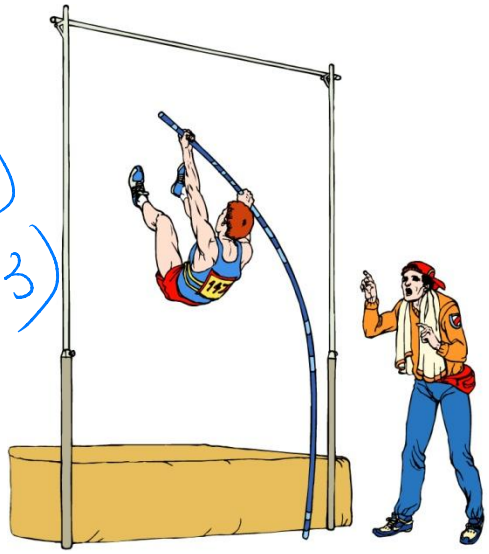
$y = 2.345x + b$
$y = 2.345x + .233125$

if force = 6.25N then extension = 14.89 ☺ not too far off

10 The following table lists some male gold medal pole vaulting performances at the Olympic Games since 1896. Because of World War II, no Olympic games were held in 1940.

Use your knowledge of statistics to determine the height that the gold medalist likely would have vaulted had the Olympics been held in 1940.

Olympic Year	Vault Height (m)
1896	3.30
1904	3.50
1912	3.95
1924	3.95
1932	4.31
1948	4.30
1956	4.56
1964	5.10
1972	5.50
1980	5.78
1988	5.90
1996	5.92
2004	5.95
2008	5.96



1923.14 3.98

(1923.14, 3.98)

(1987.43, 5.73)

1987.43 5.73

$y = .027x - 47.93$

In 1940, height was around 4.45 meters