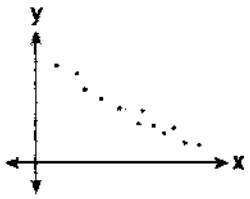
Statistics Review for Quiz 2014 **Name:** Answers

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



(1) -0.8 (2) -0.2 (3) 0.2 (4) 0.8

negative, strong correlation
∴ r is close to -1

2) The accompanying table shows the amount of water vapor, y, that will saturate 1 cubic meter of air at different temperatures, x.

Amount of Water Vapor That Will Saturate 1 Cubic Meter of Air at Different Temperatures

Air Temperature (x) (°C)	Water Vapor (y) (g)
–20	1
–10	2
0	5
10	9
20	17
30	29
40	50

(a) Write an exponential regression for this set of data, rounding all values to the nearest thousandth.

$y = 4.194\,(1.068)^x$

(b) Using this equation, predict the amount of water vapor that will saturate 1 cubic meter of air at a temperature of 50°C, and round your answer to the nearest tenth of a gram.

$y = 4.194\,(1.068)^{50}$
$= 112.5$ grams

(c) Using this equation, predict the temperature at which 20 grams of water vapor will saturate 1 cubic meter of air. Round answer to nearest degree.

$\frac{20}{4.194} = \frac{4.194}{4.194}(1.068)^x$
$4.7687 = 1.068^x$

$\frac{\log 4.7687}{\log 1.068} = x$
$23.744 = x$

24°

3) The accompanying table shows the number of new cases reported by the Nassau and Suffolk County Police Crime Stoppers program for the years 2000 through 2002.

Year (x)	New Cases (y)
2000	457
2001	369
2002	353

a) If x = 1 represents the year 2000, and y represents the number of new cases, find the equation of best fit using a power regression, rounding all values to the nearest thousandth.

$y = 451.431\,x^{-.243}$

b) Using this equation, find the estimated number of new cases, to the nearest whole number, for the year 2007.

$x = 8$

$y = 451.431\,(8)^{-.243}$
$= 272$ cases

c) Using this equation, predict the year in which approximately 250 new cases will be reported.

$250 = 451.431\,x^{-.243}$
$(.553794)^{-\frac{1}{.243}} = (x^{-.243})^{-\frac{1}{.243}}$
$11.38 = x$

2010

a) $IQR = Q_3 - Q_1 = 4 - 2 = \boxed{2}$

4) The table shows the scores of 180 students on an advanced placement mathematics examination. b) How many students scored within 1 standard deviation of the mean?

Score	Frequency
1	20
2	45
3	56
4	48
5	11

b) S.D = 1.09 mean = 2.92

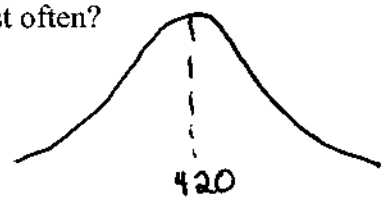
1.83 ← −1.09 — 2.92 — +1.09 → 4.01

$\boxed{149}$

5) In a certain population, the mean score on a test is 420. The standard deviation is 105. If the distribution of scores is normal, which of these scores should occur most often?

(1) 540 (2) 526 (3) 385 (4) 314

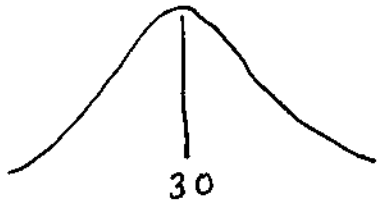
closest to the mean



6) If the mean of a test score is 30 and the standard deviation is 3.7, which score could be expected to occur less than 5% of the time?

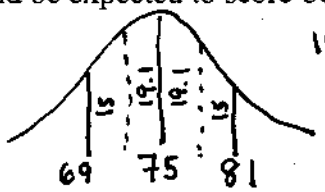
(1) 35 (2) 33.8 (3) 25 (4) 22

farthest from the mean



7) On a standardized test with normal distribution, the mean is 75 and the standard deviation is 6. If 1200 students took the test, approximately how many students would be expected to score between 69 and 81?

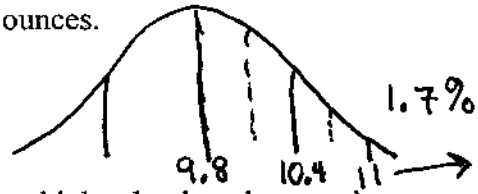
(1) 408 (2) 600 (3) 816 (4) 1140



15 + 15 + 19.1 + 19.1 = 68.2%

68.2% of 1200 → .682 × 1200 = 818.4

8) The weights of the boxes of animal crackers coming off an assembly line differ slightly and form a normal distribution whose mean is 9.8 ounces and whose standard deviation is 0.6 ounce. Determine the number of boxes of animal crackers in a shipment of 5,000 boxes that are expected to weigh more than 11 ounces.



1.7% + .5% + .1% = 2.3% of 500

.023 × 5000 = $\boxed{115 \text{ boxes}}$

9) Twenty high school students took an examination and received the following scores: 70, 60, 75, 68, 85, 86, 78, 72, 82, 88, 88, 73, 74, 79, 86, 82, 90, 92, 93, 73.

14 scores are within 1 S.D. of mean

Determine what percent of the students scored within one standard deviation of the mean. Do the results of the examination approximate a normal distribution? Justify your answer.

1 var stats

$\bar{x} = 79.7$

$\sigma x = 8.7$

71 ← −8.7 — 79.7 — +8.7 → 88.4

$\frac{14}{20} = .7$

Yes, data is approx. normally distributed since 70% of data are within 1 S.D of mean which is close to 68.2%