

## Practice Exam 1 Answer Key

Name: \_\_\_\_\_

**For full points show all formula and calculate to two decimal places.**

The following is a sample of the stock markets with their 2005 to 2006 growth rates:

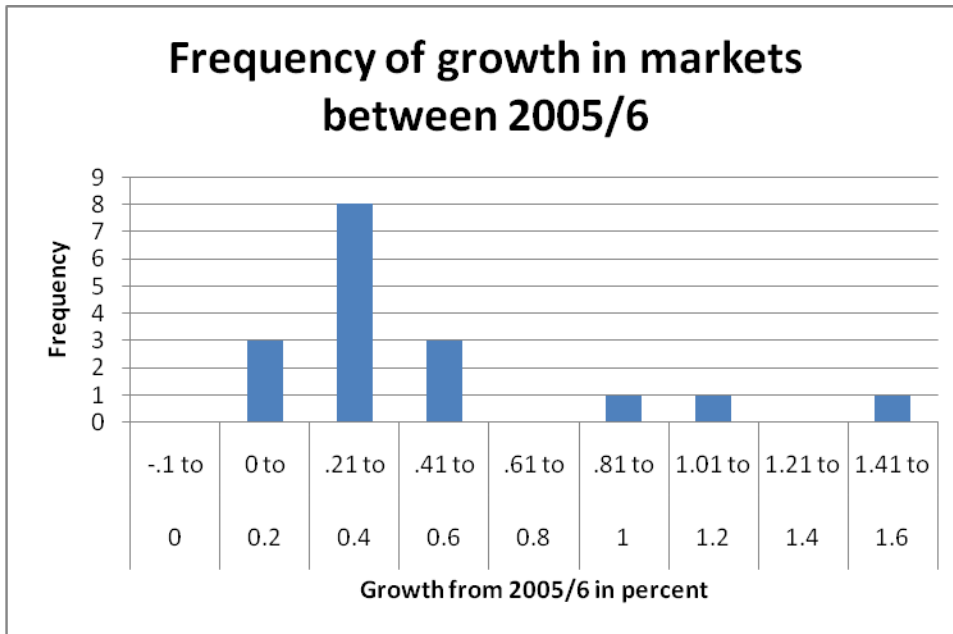
	<i>Growth 2005/6</i>
Athens Exchange	43.50%
BME Spanish Exchanges	37.80%
Borsa Italiana	28.60%
Budapest SE	28.30%
Cairo & Alexandria SEs	17.60%
Cyprus SE	145.50%
Deutsche Börse	34.10%
Euronext	37.00%
Irish SE	43.10%
Istanbul SE	0.50%
JSE	29.50%
Ljubljana SE	92.20%
London SE	24.10%
Luxembourg SE	55.20%
Malta SE	9.90%
Mauritius SE	112.80%
OMX	39.90%

Create a table with the data using reasonable intervals showing **frequency (2), percent frequency (2) and cumulative percent frequency (2)**.

		Frequency	Percent	Cumulative
0	-.1 to	0	0%	0%
0.2	0 to	3	18%	18%
0.4	.21 to	8	47%	65%
0.6	.41 to	3	18%	82%
0.8	.61 to	0	0%	82%
1	.81 to	1	6%	88%

1.2	1.01 to	1	6%	94%
1.4	1.21 to	0	0%	94%
1.6	1.41 to	1	6%	100%
		17	100%	

Create and plot a frequency histogram or bar graph (3 points) - remember to label all axes clearly:



Plot the data on a stem leaf. Be sure to label the graph correctly. (4 points)

Leaf	Unit 1%	Growth 2005/6	Frequency
0	1		1
1	0,8		2
2	4,8,9		3
3	0,4,7,8		4
4	0,3,4		3
5	5		1
6			
7			
8			

9	2	1
10		
11	3	1
12		
13		
14	6	1
		17

What is the median of the data given? (2 points)

Median 0.37

What is the mode of the data given? (2 points)

No mode

What is the mean of the data given? (3 points)

Mean 0.458588235

What is the standard deviation of the data given? (3 points)

Standard Deviation 0.36356795

Calculate plus one, two, three and minus one, two three standard deviations (3 points)

-0.63212	-0.26855	0.09502	0.458588235	0.822156	1.185724	1.549292
-3	-2	-1	0	+1	+2	+3

Is the distribution normal? Use the empirical rule to determine this. (3 points)

Between plus and minus one standard deviation: 70.5%  
 Between plus and minus two standard deviations: 94.1%  
 Between plus and minus three standard deviations: 100%  
 Distribution is normal.

The New York Stock Exchange growth rate between 2005 and 2006 was 13%. What is the z-score for the New York Stock Exchange? (2 points). Show the formula you used.

Z=-.9

What conclusions would you draw about the growth of the New York Stock Exchange as compared to the distribution?  
 What percentile does it sit in? (2 points)

Lower than average. 18 percentile.

A linear regression was run between the size of the market and the growth rate of the market between 2005 and 2006.

	Size (\$M)	Growth 2005/6		SSxx	SS yy	SS xy
Athens Exchange	208.2561	44%		386781.0768	0.000556	14.66993
BME Spanish Exchanges	1322.9153	38%		242794.6206	0.006494	-39.7092
Borsa Italiana	1026.5042	29%		38545.7992	0.029787	-33.8844
Budapest SE	41.7841	28%		621557.6234	0.030831	138.4319
Cairo & Alexandria SEs	93.4964	18%		542692.9417	0.079856	208.1762
Cyprus SE	16.1578	146%		662621.33	0.992836	-811.095
Deutsche Börse	1637.6098	34%		651953.6065	0.013827	-94.945
Euronext	3708.1501	37%		8282750.123	0.007848	-254.955
Irish SE	163.2695	43%		444760.7569	0.000761	18.3987
Istanbul SE	162.3989	1%		445922.7279	0.205742	302.8946
JSE	711.2323	30%		14146.97547	0.026761	19.45736
Ljubljana SE	15.1817	92%		664211.404	0.21475	-377.677
London SE	3794.3103	24%		8786107.806	0.047345	-644.961
Luxembourg SE	79.5136	55%		563490.0735	0.008726	-70.1205
Malta SE	4.5035	10%		681730.7158	0.129304	296.9012
Mauritius SE	4.9585	113%		680979.5632	0.448112	-552.409
OMX	1122.705	40%		85574.76109	0.003551	-17.4314
<b>Average</b>	<b>830.173359</b>	<b>46%</b>	<b>Sum</b>	<b>23796621.9</b>	<b>2.247088</b>	<b>-1898.26</b>

$$SS_{XX} = \sum (x_i - \bar{x})^2$$

$$SS_{YY} = \sum (y_i - \bar{y})^2$$

$$SS_{xy} = \sum (x_i - \bar{x})(y_i - \bar{y})$$

Measure	Significance	Formula
Least Squares Slope	Change in y for every unit change in x	$\frac{SS_{xy}}{SS_{xx}}$
Standard Error of Slope	Used to test validity of model	$\frac{s}{\sqrt{SS_{xx}}}$
Least Squares Y-intercept	When x=0 gives the value of y	$\bar{y} - \left(\frac{SS_{xy}}{SS_{xx}}\right) \bar{x}$
Sum of Square errors (SSE)	Used for calculating standard error of regression.	$SS_{YY} - \left(\frac{SS_{xy}}{SS_{xx}}\right) SS_{xy}$
Estimated standard error of the regression model (s)	Most observed y values should be within 2s of their predictions	$\sqrt{\frac{SSE}{n-2}}$
Coefficient of Correlation (r)	Strength of relationship between x and y	$R = \frac{SS_{xy}}{\sqrt{SS_{YY}SS_{XX}}}$
Coefficient of Determination (r square)	Amount of variation explained by the model (reliability)	$\frac{SS_{YY} - SSE}{SS_{YY}}$

What is the slope of the best fit (regression) line? (3)

Slope -7.977E-05

What is the y-intercept of the best fit (regression) line? (3)

Intercept 0.52481117

What is the R-square? (3)

SSE 2.09566416

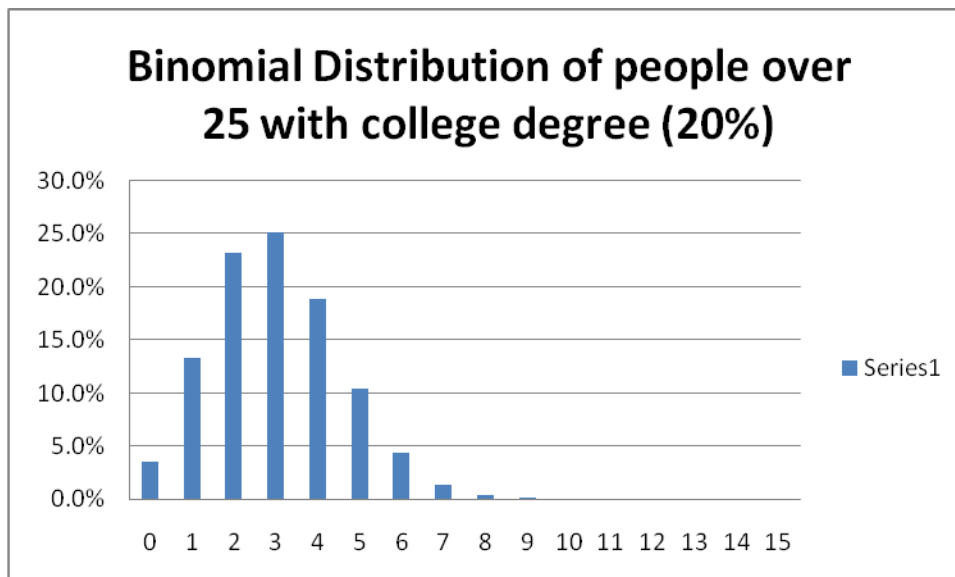
R square 0.06738675

What can you say about the relationship between size and growth rate?

Size of market is inversely related to growth rate. The larger the market the smaller the growth. Low R square out of 1. This suggests that the relationship is very weak.

According to the census, 20% of people over 25 years have completed at least 4 years of college. Plot a binomial distribution for **random sample of 15**. Label all axes correctly. (4 points)

X	P(X)
0	3.5%
1	13.2%
2	23.1%
3	25.0%
4	18.8%
5	10.3%
6	4.3%
7	1.4%
8	0.3%
9	0.1%
10	0.0%
11	0.0%
12	0.0%
13	0.0%
14	0.0%
15	0.0%



What is the mean? (3 points)

$$np = .2 * 15 = 3$$

What is the standard deviation? (3 points)

$$\text{Sqrt}(npq) = 1.549193$$

What is the probability that 5 or less in the random sample have completed at least 4 years of college? (2 points)

93.9%

What is the probability that more than 9 in the random sample have completed at least 4 years of college? (2 points)

0%

What is the probability that none of the sample has completed at least 4 years of college? (2 points)

3.5%

Here are the number of children in grades 1 to 8 in 2003.

Grade	2003	
1	3,613	12%
2	3,544	12%
3	3,611	12%
4	3,619	12%
5	3,685	12%
6	3,772	13%
7	3,841	13%
8	3,809	13%

Calculate the probabilities for each grade (8 points)

What is the mean of the distribution? (3 points)

What is the standard deviation of the distribution? (3 points)

Grade	2003		Mean	Standard Deviation
1	3,613	12%	0.122488	1.550455
2	3,544	12%	0.240315	0.786119
3	3,611	12%	0.367314	0.297131

