

Zicklin MBA/MS QuickStart Self-Assessments

Section 1: Excel

- A. Enter the following data into a current worksheet:

1564.28
894.35
8876.89
43693.12

Using the *AutoSum Function*, compute the total of these cells.

- B. The third number in the column you summed above (8876.89) represents what percentage of the total? Calculate that figure and display it in *percentage format* with 2 decimal positions.
- C. Enter the value of 15% in cell D20. In cells D30 through cell H35 enter the values of 100, 125, 130, 135 and 140 respectively. Create one formula starting in cell D50 and ending in cell H50 using absolute addressing (do not use the value of 15%) that when entered and copied will produce the correct result.
- D. Create an Excel formula using the IF function that will multiply the contents of cell AA11 by 10 if the contents of cell A9 is positive, and if not, divide the contents of cell AB19 by 9.
- E. Insert a new worksheet into your current workbook. What is the monthly payment amount for a \$5,000 loan with a 6% annual percentage rate? The loan has a term of 4 years.
- F. Type the following data in Excel, and create a 2-dimensional line chart. Use column headings as your x-axis. Include appropriate labels and chart headings.

Units This Year

	Q1	Q2	Q3	Q4
Bronx	343	248	519	225
Brooklyn	541	355	400	598
Manhattan	156	124	481	298
Queens	301	279	645	542
Staten Island	88	79	121	78

- G. You are given a multiplication table as follows (or create your own):

	A	B	C	D	E
1		1	2	3	4
2	1				
3	2				
4	3				
5	4				

Create one (only 1) formula, that when copied across or down will produce the correct results for all the cells.

H. You need to use a feature in Excel such as Data Analysis or Solver in order to complete an assignment.

(a) How can these features be accessed in Excel?

(b) If one or more of these features couldn't be found, how would one add them into their Excel program?

I. Explain the function: =VLOOKUP(A4,grades,2,TRUE)

Excel Answer Key

A) The sum is **55028.64**.

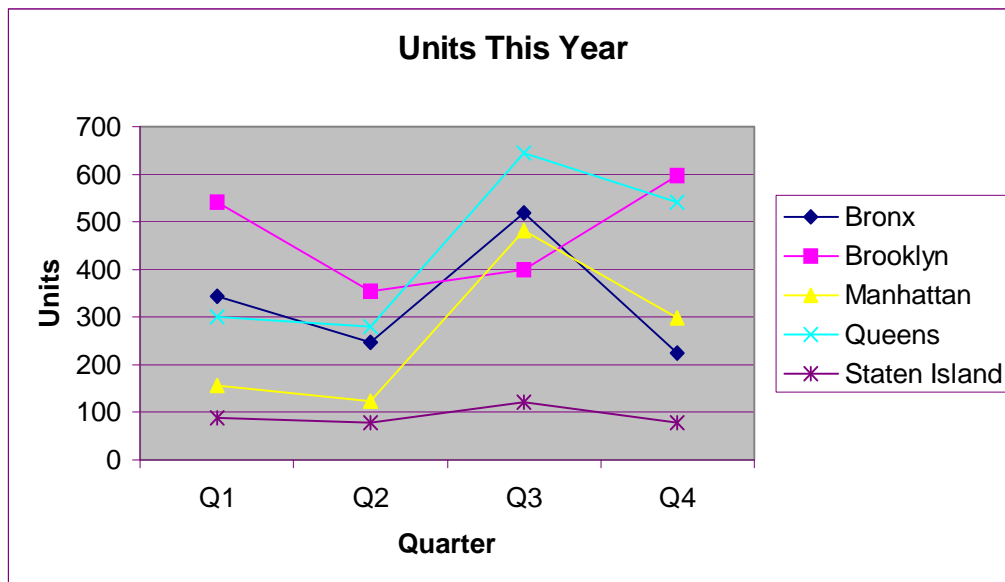
B) The percentage is **16.13%**.

C) **=D30*\$D\$20** This formula needs to use absolute addressing to keep the value of 15% (D20) as a fixed address when the formula is copied.

D) **=IF(A9>0,AA11*10,AB19/9)**

E) **\$117.43** **=-PMT(.06/12,48,5000)**
The interest rate and term must be converted to months

F)



G) **=\$A2*B\$1** This is a mixed address where the column is constant or the row is constant, but not both

H) **Data Analysis and Solver** can be found under the Tools menu bar.
These features are not installed in Excel during the default installation.

If they don't appear, one needs to choose Add-Ins from the Tools menu bar. At that point you can select which modules you wish to include into your Excel program.

- I) The **VLOOKUP** function looks up the value in cell A4 from the table called "grades". (You would need to name this range prior to using this formula). Use the first (sorted) column of the table until it finds a match or if the lookup value is higher than the value in the table, it backs up to the preceding row. The value in the corresponding row from the 2nd column is then returned.

SECTION 2: Mathematics

1. Solve the following simultaneous equations:

$$2X - 4Y = -24$$

$$9X - 3Y = -3$$

2. Solve the following simultaneous equation:

$$Y = -45 + 8X$$

$$Y = 125 - 2X$$

3. Change the following equation in such a way that Y will be the dependent variable and X will be the independent variable. What is the slope?

$$2X - 5Y = 20$$

4. Differentiate the following function [Find the first derivative of Y to X]

$$Y = 5X + 12$$

5. Differentiate the following function:

$$Y = 3X^2$$

6. Differentiate the following function:

$$Y = 5X^3 - 7X^2 + 4X + 9$$

7. Differentiate the following function:

$$Y = 2X^2(3X - 4)$$

8. Differentiate the following function:

$$Y = (6X - 7) / (8X - 5)$$

9. Differentiate the following function:

$$Y = 2(2X + 4)^6$$

10. Find the second derivative of the following function:

$$Y = 7X^3 + 5X^2 - 10X + 12$$

11. From the following function, find the maximum or minimum value of Y, if any:

$$Y = 32X - X^2$$

12. From the following function, find the maximum or minimum value of Y, if any.

$$Y = X^2 - 12X + 40$$

13. Find the first partial derivatives from the following function:

$$Z = 8X^2 + 14XY + 5Y^2$$

14. Find the first partial derivatives from the following function:

$$Z = (2X + Y)^2$$

15. Transform the following exponential function into a logarithmic function:

$$Y = e^{4+2t}$$

16. Simplify the following equation using the rules of logarithm:

$$\log_e (X^3 e^2)$$

17. Simplify the following function using the rules of logarithm:

$$\log_e (2X^3 Y^2)$$

18. Find the first derivative of Y to X from the following function:

$$Y = \log_e X^2$$

19. Find the first derivative of Y to X from the following function:

$$Y = \log_e (X + 5)^2$$

20. Find the first partial derivative from the following function:

$$Z = X^{0.6} Y^{0.3}$$

Mathematics Answer Key

1. $X = 2$ and $Y = 7$
2. $X = 17$ and $Y = 91$
3. $Y = -4 + (2/5) X$ & slope is $2/5$ or 0.4
4. $Y' = dy/dx = 5$
5. $Y' = 6X$
6. $Y' = 15X^2 - 14X + 4$
7. $Y' = 18X^2 - 16X$
8. $Y' = 26/(8X - 5)^2$
9. $Y' = 12(2X + 4)^5$
10. $Y'' = 42X + 10$
11. $Y = 256$ (maximum)
12. $Y = 4$ (minimum)
13. $Z_x = 16X + 14Y$ & $Z_y = 14X + 10Y$
14. $Z_x = 8X + 4Y$ & $Z_y = 4X + 2Y$
15. $\log_e Y = 4 + 2t$
16. $3 \log_e X + 2$
17. $\log_e 2 + 3 \log_e X + 2 \log_e Y$
18. $Y' = 2/X$
19. $Y' = 2/(X+5)$
20. $Z_x = 0.6 X^{-0.4} Y^{0.3}$ & $Z_y = 0.3 X^{0.6} Y^{-0.7}$

SECTION 3 : Statistics

1. Closing prices are recorded for 30 technology stocks, at the end of the third quarter of 2008. The sample results are as follows:

7.2 4.3 3.8 4.5 3.6 6.6 5.1 3.1 3.5 3.2 4.2 3.7 6.8 5.4 3.9
4.9 3.7 4.7 5.5 5.9 4.7 4.2 5.9 3.6 2.8 4.9 4.2 5.9 3.7 4.5

(a) Compute the sample average.

(b) Find the sample median.

(c) Find the sample standard deviation.

(d) What percentage of the stock prices actually fall within 1 standard deviation of the mean? Does this answer make sense to you? Explain.

(e) Suppose a stock is considered to be a great performer if its closing price is more than 1.75 standard deviations above the mean closing price. If a stock has a closing price of \$6.85, will it be considered a great performer? Fully explain your answer.

2. In a police force consisting of 1200 officers, 960 are men, 324 received promotions and 288 were men who received promotions.

(a) If an officer is chosen at random, what is the probability the officer is a man or received a promotion?

(b) If an officer chosen at random did receive a promotion, what is the probability the officer is a woman?

3. 60% of all New Yorkers take public transportation. If a random sample of 6 New Yorkers is taken, what is the probability that exactly 3 take public transportation?

4. The time it takes workers to complete a task is Normally Distributed with a mean of 2 minutes and a standard deviation of .5 minutes.

(a) What percentage of the workers take between 1.5 and 2.25 minutes to complete the task?

(b) 10% of the workers take less than _____ minutes to complete the task.

Statistics Answer Key

1. Closing prices are recorded for 30 technology stocks, at the end of the third quarter of 2008. The sample results are as follows:

7.2 4.3 3.8 4.5 3.6 6.6 5.1 3.1 3.5 3.2 4.2 3.7 6.8 5.4 3.9
4.9 3.7 4.7 5.5 5.9 4.7 4.2 5.9 3.6 2.8 4.9 4.2 5.9 3.7 4.5

- (a) Compute the sample average.

$$\bar{x} = \frac{x_1 + x_2 + \dots + x_n}{n} = \frac{\sum_{i=1}^n x_i}{n} = \frac{138}{30} = 4.6$$

- (b) Find the sample median.

First create an ordered array:

2.8 3.1 3.2 3.5 3.6 3.6 3.7 3.7 3.7 3.8 3.9 4.2 4.2 4.2 4.3 4.5 4.5 4.7 4.7 4.9 4.9
5.1 5.4 5.5 5.9 5.9 5.9 6.6 6.8 7.2

The median falls in the middle – in position $(n+1)/2 = 31/2 = 15.5$. So the median is in between the 15th & 16 values which are 4.3 & 4.5. So the median is 4.4.

- (c) Find the sample standard deviation.

$$s = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n - 1}} = \sqrt{\frac{37.38}{29}} = \sqrt{1.29} = 1.14$$

- (d) What percentage of the stock prices actually fall within 1 standard deviation of the mean? Does this answer make sense to you? Explain.

$$\bar{x} + s = 4.6 + 1.14 = 5.74 \quad \bar{x} - s = 4.6 - 1.14 = 3.46$$

21 values fall between 3.46 & 5.74 (within 1 standard deviation of the mean). Answer is 70%. This makes sense, because usually around 2/3 of any sample will fall within 1 standard deviation of the mean.

- (e) Suppose a stock is considered to be a great performer if its closing price is more than 1.75 standard deviations above the mean closing price. If a stock has a closing price of \$6.85, will it be considered a great performer? Fully explain your answer.

$$z = \frac{x - \bar{x}}{s} = \frac{6.85 - 4.6}{1.14} = 1.98$$

So, \$6.85 is 1.98 standard deviations above the mean so it will be considered a great performer.

5. In a police force consisting of 1200 officers, 960 are men, 324 received promotions and 288 were men who received promotions.

- (a) If an officer is chosen at random, what is the probability the officer is a man or received a promotion?

$$P(\text{Man or Prom}) = P(\text{Man}) + P(\text{Prom}) - P(\text{Man \& Prom}) = 960/1200 + 324/1200 - 288/1200 = 996/1200 = .83$$

- (b) If an officer chosen at random did receive a promotion, what is the probability the officer is a woman?

$$P(\text{Woman}|\text{Prom}) = P(\text{Woman \& Prom})/P(\text{Prom}) = 36/324 = .11$$

6. 60% of all New Yorkers take public transportation. If a random sample of 6 New Yorkers is taken, what is the probability that exactly 3 take public transportation?

If $X = \#$ New Yorkers in the sample of 6 who take public transportation, then the random variable X has a binomial distribution with $n=6$ and $\text{prob}(\text{success})=.6$.

$$P(X = 3) = {}_6C_3 \cdot .6^3 \cdot (.4)^3 = 20(.216)(.064) = .27648$$

7. The time it takes workers to complete a task is Normally Distributed with a mean of 2 minutes and a standard deviation of .5 minutes.

- (a) What percentage of the workers between 1.5 and 2.25 minutes to complete the task?

X has a Normal Distribution mean $\mu=2$ and $\sigma=.5$.
 $P(1.5 < X < 2.25) = P(-1 < Z < 2.5) = .9968 - .1587 = .8381$

- (b) 10% of the workers take less than _____ minutes to complete the task.

$$X = 2 - z(.5) = 2 - 1.28(.5) = 1.36. \text{ Answer: } 1.36 \text{ minutes}$$

SECTION 4: Accounting

Part I.

Fish Company begins 2003 with the following balance sheet:

Balance Sheet for Fish Company at January 1, 2003

Assets		Liabilities and Equity	
Cash	?	Accounts Payable	\$20
Accounts receivable	30	Capital Stock	200
Inventory	40	Retained Earnings	<u>300</u>
Equipment	500		\$520
Accumulated depreciation	<u>-100</u>		
	?		

Transactions during the year:

1. Shareholders contribute cash to the business	\$30
2. The business buys inventory on account	800
3. Sales on account	950
4. Collections of receivables	900
5. Payments on account	810
6. Salary expense (payments \$70)	100
7. Declared dividends to shareholders (paid \$35)	40

Adjusting entries:

a. Depreciation expense	\$50
b. Ending inventory	140

T-accounts are on the next page. Answer the following:

1. Cash at the beginning of 2003: _____
2. Total assets (net of contra accounts) at the end of 2003: _____
3. Income for the year: _____
4. Retained earnings at the end of 2003: _____
5. Capital stock at the end of 2003: _____

Cash	Accounts Payable	Capital Stock	Retained Earnings
?	20	200	300
Accounts Receivable	Dividends Payable	Dividends Declared	Sales Revenue
30			
Inventory	Salaries Payable		Cost of Goods Sold
40			
Equipment			Salaries
500			
Accumulated Depreciation		Income Summary	Depreciation Expense
100			

Part II. Five multiple choice questions at 10 points each (no partial credit)

1. **Retained Earnings.** The Three Children Corporation began the year with retained earnings of \$500,000. During the year, the corporation earned \$100,000 and declared dividends of \$30,000. Three Children should report ending retained earnings of:

- a. \$470,000
- b. \$500,000
- c. \$530,000
- d. \$570,000
- e. \$600,000

2. **Interest Receivable.** Interest receivable increases with interest income and decreases as payments are received. The EggCrate Corporation's beginning Interest Receivable account balance is \$9,000. During the year, the company earned \$100,000 in interest and collected \$105,000. EggCrate's beginning Interest Receivable is shown in the following T-account.

Cash	Interest Receivable	Interest Revenue
	9,000	

The ending Interest Receivable account balance is:

- a. \$2,000
- b. \$3,000
- c. \$4,000
- d. \$5,000
- e. \$6,000

3. **Prepaid Accounts.** The Mystery Corporation begins the year with \$20,000 in prepaid rent and ends the year with \$30,000 of prepaid rent. During the year, rent expense is \$200,000. The relevant T-accounts are:

Prepaid Rent	Cash	Rent Expense
20,000		
<hr style="width: 50%; margin: 0 auto;"/> 30,000		

The amount paid to the landlord during the year was:

- a. \$200,000
- b. \$210,000
- c. \$220,000
- d. \$230,000
- e. \$250,000

4. **Accounting for Depreciable Property.** The Sliding Stones concert group bought a new bus for \$200,000. They planned to use the bus for three years and sell it for \$80,000. At the end of two years they sold the bus for \$100,000.

$$\begin{aligned} \text{Annual depreciation expense} &= \text{Amount to be depreciated} / \text{expected life} \\ &= (\text{Cost}-\text{Residual value}) / \text{expected life} \\ &= \end{aligned}$$

Equipment	Accumulated Depreciation	Depreciation Expense
200,000		

The gain or loss on sale is:

- a. \$40,000 loss
- b. \$20,000 loss
- c. none
- d. \$20,000 gain
- e. \$40,000 gain

5. **Dividends Payable.** Dividends payable increase when dividends are declared and decrease when dividends are paid. During the year, the Butch Company declared \$30,000 in dividends. Beginning and ending Dividend Payable account balances were \$5,000 and \$5,500.

Cash	Dividends Payable	Dividends Declared
	5,000 <hr style="width: 20%; margin: 0 auto;"/> 5,500	

The dividend payments (cash) during the year were:

- a. \$28,000
- b. 28,500
- c. 29,000
- d. 29,500
- e. 30,000

Accounting Answer Key

Part I – Fill Ins:

1. \$50
2. \$635
3. \$100
4. \$360
5. \$230

Part II - Multiple Choice :

1. d
2. c
3. b
4. b
5. d

