

## MATH 082 Final Examination Review

- 1) Write the equation of the line that passes through the points (4, 6) and (0, 3). Write your answer in slope-intercept form.
- 2) Write the equation of the line that passes through the points (-9, -2) and (3, 4). Write your answer in slope-intercept form.
- 3) Write the equation of the line that passes through the points (11, 7) and (-3, -14). Write your answer in slope-intercept form.
- 4) Graph the line:  $y = \frac{2}{5}x + 7$
- 5) Graph the line:  $y = \frac{-4}{3}x + 2$
- 6) Graph the line:  $y = \frac{3}{5}x - 4$
- 7) For the line  $2x - 10y = -5$ , find:
  - a) The y-intercept.
  - b) The x-intercept.
- 8) For the line  $3x + 2y = -6$ , find:
  - a) The y-intercept.
  - b) The x-intercept.
- 9) For the line  $-12x + 8y = -6$ , find:
  - a) The y-intercept.
  - b) The x-intercept.
- 10) Graph the linear equation:  $2x - y = -6$
- 11) Graph the linear equation:  $7x + 5y = 35$
- 12) Graph the linear equation:  $3x - 7y = 42$
- 13) Find the slope of the line  $-11x = -5y - 13$
- 14) Find the slope of the line  $y = -3$
- 15) Find the slope of the line  $8x + 5y = -11$

16) Find the slope of the line  $8y - 5x = -11$

17) Solve the following system of equations by graphing: 
$$\begin{cases} 2x - y = 1 \\ x + 2y = 8 \end{cases}$$

18) Solve the following system of equations by graphing: 
$$\begin{cases} -5x - y = 7 \\ x + 2y = 4 \end{cases}$$

19) Solve the following system of equations by graphing: 
$$\begin{cases} 5x + 3y = 3 \\ -x - 3y = 9 \end{cases}$$

20) Solve the following system of equations by using the addition method: 
$$\begin{cases} -2x + y = -1 \\ -x - 2y = -8 \end{cases}$$

21) Solve the following system of equations by using the addition method: 
$$\begin{cases} -5x - y = 7 \\ 0.5x + y = 2 \end{cases}$$

22) Solve the following system of equations by using the addition method: 
$$\begin{cases} -5x - 3y = -3 \\ x + 3y = -9 \end{cases}$$

23) Solve the following system of equations by using substitution method: 
$$\begin{cases} y = 3x \\ 2x - 3y = 7 \end{cases}$$

24) Solve the following system of equations by using the substitution method: 
$$\begin{cases} x = y + 3 \\ y - 2x = -5 \end{cases}$$

25) Solve the following system of equations by using the addition method: 
$$\begin{cases} 3x - 5y = 4 \\ 7x + 11y = -2 \end{cases}$$

26) An adult's ticket for a play cost \$5.50 and a child's ticket cost \$2.00. For one performance, 398 tickets were sold. Receipts for the performance were \$1426.00. Find the number of children's tickets sold.

27) Two investments earn an annual income of \$86. One investment earns an annual simple interest rate of 5%, and the other investment earns an annual simple interest rate of 6%. The total amount invested is \$1500. How much is invested in each account?

28) Two burgers and one order of fries contain 34 grams of fat. Two orders of fries and one burger contain 41 grams of fat. Find the number of grams of fat in each item.

29) Simplify:  $(3y^2 - 11y - 13) - (3y^2 - y - 1)$

30) Simplify:  $-4(t^2 - 7t - 11) - 2(3t^2 - 7t - 5)$

31) Simplify:  $3(x^2 - 7x - 2) - (x^2 + 7x + 13)$

32) Simplify:  $(-3z^7)(-5z^3)$

33) Simplify:  $(-2x^4)(3x^2)(-4x^5)$

34) Simplify:  $(-2t)(-3t^7)(-4t^4)$

35) Simplify by performing the following operation:  $(2t - 5)(3t + 5)$

36) Simplify by performing the following operation:  $(3x - 1)(x + 3)$

37) Simplify by performing the following operation:  $(5x - 7)(2x + 3)$

38) Simplify and write the final answer using positive exponents only:  $(4x^3)^2$

39) Simplify and write the final answer using positive exponents only:  $(-3x^{-3}y^4)^3$

40) Simplify and write the final answer using positive exponents only:  $(-4x^5y^{-2})^4$

41) Simplify and write the final answer using positive exponents only:  $\frac{16x^{11}y^5}{-8x^8y^2}$

42) Simplify and write the final answer using positive exponents only:  $\frac{-60x^{13}y^4t^5}{15x^9y^3t}$

43) Simplify and write the final answer using positive exponents only:  $\frac{-15x^9y^3t}{60x^{13}y^4t^5}$

44) Simplify:  $\frac{8y^{-3}}{4y^{-5}}$

45) Write:

a)  $4.05643 \times 10^4$  in decimal notation.

b)  $787.507$  in scientific notation.

c)  $(7 \times 10^{11})(8 \times 10^{-8})$  in scientific notation after simplifying.

d)  $\frac{8 \times 10^5}{2 \times 10^{-8}}$  in scientific notation after simplifying.

46) Factor out the GCF from the polynomial:  $8z^5 - 12z^7$

47) Factor out the GCF:  $6x^2y^3 + 9x^3y$

48) Factor out the GCF:  $28r^4s^2 + 7r^3s - 35r^4s^3$

49) Factor completely:  $x^2 - 8x - 33$ .

50) Factor completely:  $x^2 + 7x - 18$ .

51) Factor completely:  $81 - 4x^2$ .

52) Factor completely:  $x^2 - 3x - 40$ .

53) Factor completely:  $a^2 + 2ab + b^2$ .

54) Factor completely:  $2x^3 - 6x^2 + 4x$ .

55) Factor completely:  $x^2 - 3xy - 4y^2$ .

56) Solve the equation:  $(x + 6)(x - 3) = 0$

57) Solve the equation:  $x^2 - 6x + 8 = 0$ .

58) Solve the equation:  $25x^2 - 49 = 0$

59) Solve the equation:  $z^2 + z = 30$ .

60) Solve the equation:  $2x^2 - 18 = 0$

61) Solve the equation:  $2x^2 - 10x - 12 = 0$ .

62) Indicate whether or not the following pieces of information are qualitative or quantitative variables. If they are quantitative, indicate if they are continuous or discrete.

- a. Your zip code
- b. A student ID
- c. The distance from the sun to the earth
- d. The number of minutes you spend watching television each day.
- e. Your social security number.
- f. The number of books on your bookshelf.
- g. Your daily checking account balance.

63) The table below ranks the top companies with the best reputation in the world. Identify each variable and determine whether it is quantitative-discrete, quantitative-continuous, or qualitative.

Rank	Home Country	Company	Score
1	Switzerland	Rolex	80.38
2	Denmark	Lego	79.46
3	United States	The Walt Disney Company	79.19
4	Japan	Canon	78.28
5	United States	Google	78.22

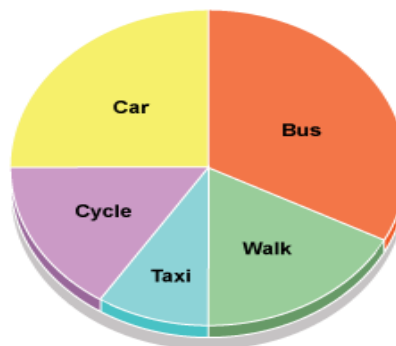
64) The following frequency table represents the number new HIV/AIDS cases in the US in 2008 by race/ethnicity.

Race/Ethnicity	Number of HIV/AIDS Cases
American Indian/ Alaskan Native	228
Asian	451
Black/African American	21,443
Hispanic/Latino	7,461
Native Hawaiian/ Other Pacific Islander	47
White	12,534

What percent of the new cases were Hispanic/Latino (rounded to the nearest tenth of a percent)?

65) This pie chart shows the results of a survey that was given to find out students' mode of travel to school.

- What is the most common method of travel?
- What fraction of the students travel to school by car?
- If 6 students travel by car, how many people took part in the survey?



66) Twenty students answered a survey about their majors. Their responses are below:

Nursing	English	Radiation therapy	Nursing
Chemistry	Nursing	English	Nursing
Radiation therapy	Undecided	Chemistry	Nursing
Political science	Undecided	Nursing	Political science
Nursing	Radiation therapy	Nursing	English

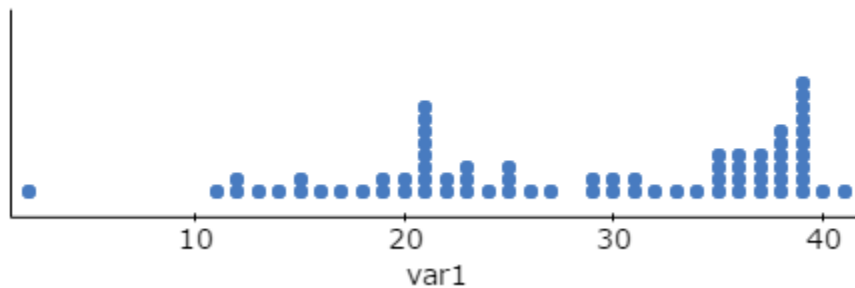
- Construct a frequency table.
- Draw a bar graph.
- How many students participated in this survey?
- What percent of students are nursing major?

67) The following table shows one city's employment in STEM occupations in 2000 and 2009 for females.

<u>STEM Occupation</u>	<u>Year 2000</u>	<u>Year 2009</u>
Computer Science and Math	2202	2534
Engineering	2185	2079
Physical Life Science	551	553
STEM Manager	382	474

- Calculate the relative frequencies for each year.
- Compare each occupation's relative frequency in year 2000 with year 2009. Are there any significant changes within STEM occupations for females?

68) Is the following dot plot of a unimodal or bimodal distribution? Justify your answer.



69) The frequency distribution below shows the number of magazines sold at a local store.

Number of pages in the magazine	Frequency (number of magazines)
10–14	4
15–19	8
20–24	10
25–29	12
30–34	14
35–39	20

- How many magazines were sold at this store?
- What is the class width?
- Identify the lower class limits.
- Identify the upper class limits.
- Draw a histogram.

70) The following set of data represents the test scores for Mr. Apple’s English class:

60, 64, 68, 72, 72, 78, 79, 80, 82, 84, 87, 85, 95, 98, 99

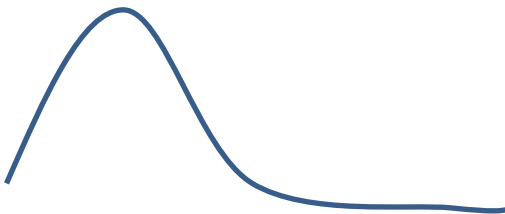
Create a frequency table and a relative frequency table to display the data. Let the first lower limit be 60 and the class width be 10.

71) The stem-and-leaf plot below shows the ages of a group of people.

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1 | 8
2 | 1
3 | 0 2 2 4
4 | 1 2 4
5 | 0 1 4
6 | 2 4 4
7 | 1
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- How many people are 44 years old or older?
- What is the total number of people in this study?
- How many people are at most 30 years old?

72) Describe the shape of the distribution shown below. Is it symmetrical, skewed left, or skewed right?



73) Construct a dot plot for the data below:

22	22	36	10	4	9	7	1
15	29	16	17	8	12	25	48

74) Use the set of data to answer the following questions.

69	72	65	69	62	70	69	63	64	67
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- Calculate the mean.
- Calculate the median.
- Calculate the range.

75) Determine which measure of center (mean or median) would be the most appropriate for each of the following situations:

- A storeowner kept a tally of the sizes of suits purchased in her store. Which measure of central tendency should the storeowner use to describe the average size suit sold?
- The science test grades are posted. The class did very well. All students taking the test scored over 75. Unfortunately, 4 students were absent for the test and the computer listed their scores as 0 until the test is taken.

76) The number of sick days used by 100 employees at an orange-processing company was recorded. The mean number of the sick days was 13 days. Assuming the distribution of sick days is skewed right, which of the following values is the most likely the value of the median?

- a. 11      b. 15      c. 17      d. 19

77) The table below shows the waiting time (in minutes) for customers for two different banks:

Bank A 5, 8, 8, 4, 9

Bank B 4, 4, 5, 6, 7

- Find the waiting-time range for each bank.
- Compute the waiting-time standard deviation for each bank.
- Which bank has a more consistent waiting time for customers? Explain your answer.

78) The prices paid for a particular model of a new car have a mean of \$18,000 and standard deviation of \$250. A sample of four prices are listed below:

\$17,500    \$29,000    \$36,000    \$30,000

Which price is two standard deviations from the mean?



79) Find the z-score for the value 82, when the mean is 91 and the standard deviation is 9.

80) Heights of men have a mean of 173 cm and a standard deviation of 7 cm. Heights of women have a mean of 162 cm and a standard deviation of 5 cm. Dwayne Johnson's height is 196 cm and Julia Robert's height is 176 cm.

- a. Find the z-score for each height.
- b. Relative to the population of the same gender, who is taller? Explain your answer.

81) A married couple is employed by the same company. The husband works in a department for which the mean hourly rate is \$12.80 and the standard deviation is \$1.20. His wife is employed in a department where the mean rate is \$13.50 and standard deviation is \$1.80.

- a. If the husband earns \$14.60 and the wife earns \$15.75, who is paid better *relative to their departments*?
- b. What would the wife need to earn in order to match her husband's z-score?

82) The test scores of 15 employees enrolled in a CPR training course are listed:

13 9 18 15 14 21 7 10 11 20 5 18 37 16 17

- a. Find the five-number summary.
- b. Find the interquartile range.

83) The following data represent the number of pop-up advertisements received by ten families during the past month.

43 37 35 30 41 23 33 31 16 21

- a. Find the mean.
- b. Find the median.
- c. Find the five-number summary.