

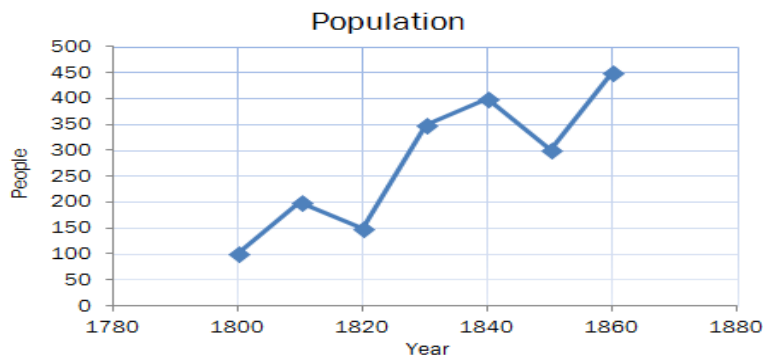
## Math 980 Modules 3 and 4 Objectives Review

Please study the following objectives from modules three and four before taking your second exam. This review provides you with sample problems that correspond to the objectives given, however, **the problems on your exam will not be exactly like the problems on this review.** You should go back and study your notes and look at all of the different types of problems that reinforce the objectives below. You will also want to review the objectives from the modules 1 and 2 objectives review because the second exam is a comprehensive exam of modules one through four. You can still watch the video lesson as another resource for preparing for your exam.

### Module 3 - Linear Equations in Two Variables

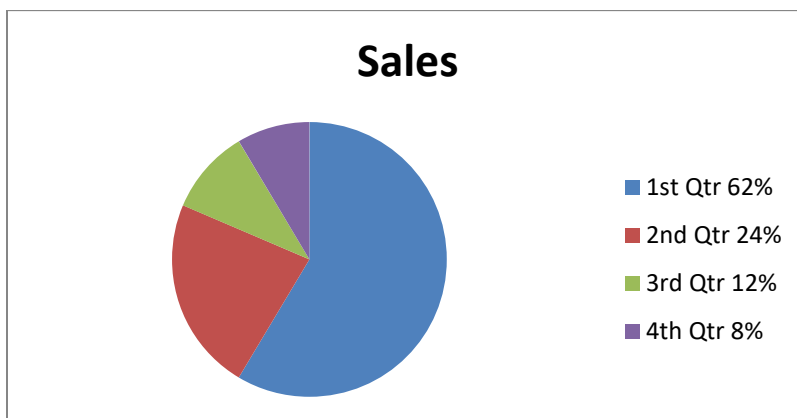
#### 3.1 Interpreting Line Graphs

The population of a small village is shown below.



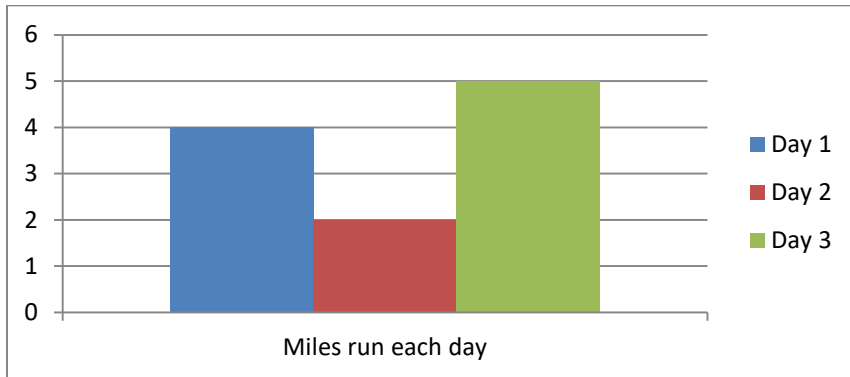
1.) What is the change in population from 1820 to 1860?

#### 3.1 Interpreting Pie Charts



2.) If total sales is \$280,000, what is the amount of sales during the 1<sup>st</sup> quarter?

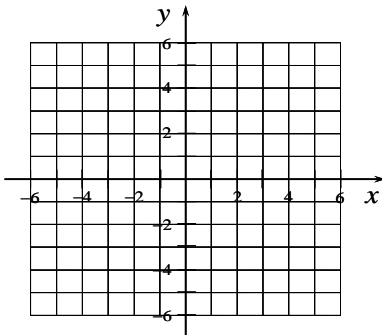
### 3.1 Interpreting Histograms



3.) The number of miles run on day 3 is what percent of the number of miles run on day 2?

### 3.2 Plotting Points

4.) Plot the points  $(2, -4)$ ,  $(0, 3)$ ,  $(-5, 0)$ ,  $(-3, -2)$



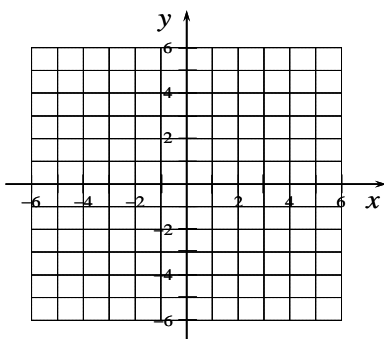
### 3.2 Determine Whether the Point is a Solution

5.) Is  $(-5, 29)$  a solution to the equation  $y = -6x + 1$ ?

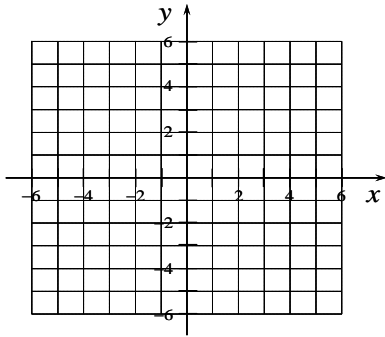
6.) Is  $(2, 3)$  a solution to the equation  $y = -\frac{1}{2}x + 4$ ?

### 3.3 Graph Linear Equations

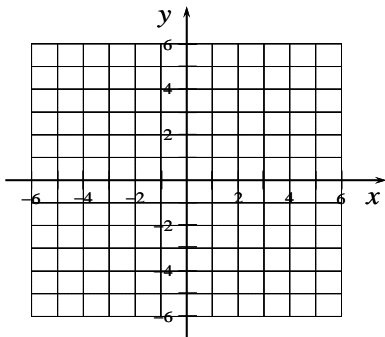
7.) Graph  $x - y = -5$



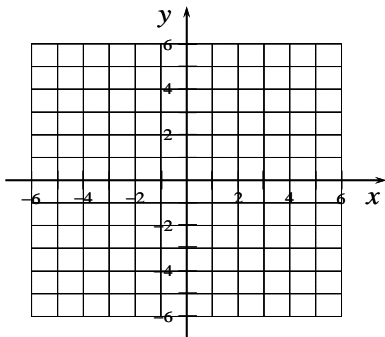
8.) Graph  $y = -3x - 2$



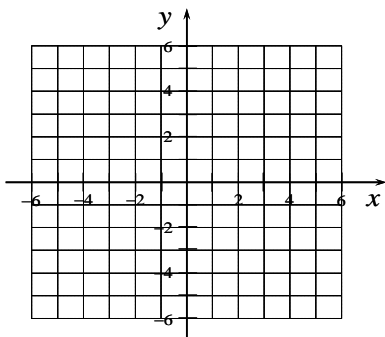
9.) Graph  $y = \frac{1}{3}x + 1$



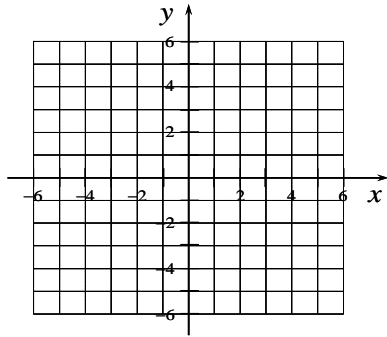
10) Graph  $2x + 3y = 0$



11.) Graph  $y = 4$

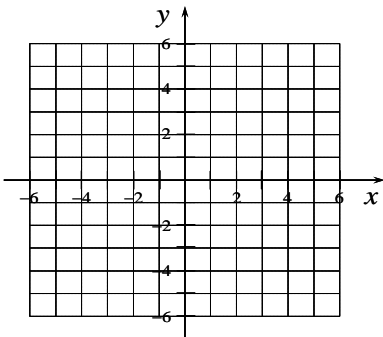


12.) Graph  $x = -2$

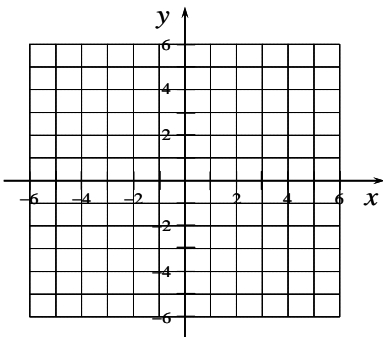


### 3.4 Graph a Linear Inequality

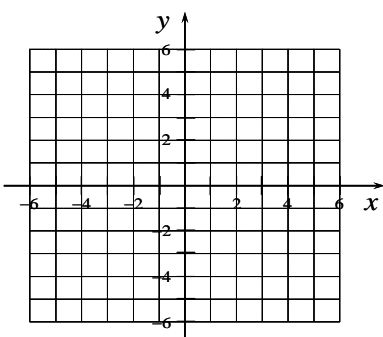
13.) Graph  $2x + y \leq 2$



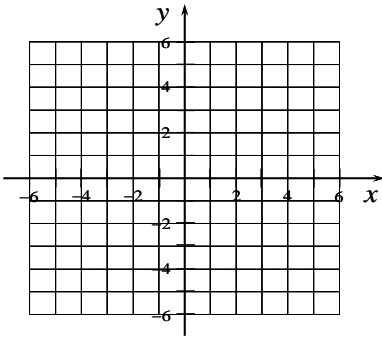
14.) Graph  $y > \frac{1}{4}x$



15.) Graph  $x < -2$



16.) Graph  $y \geq 3$



### 3.5 Find the Slope of a Line Given Two Points

17.) Find the slope of the line that passes through the points  $(8, 2)$  and  $(-3, -5)$

18.) Find the slope of the line that passes through the points  $(5, -1)$  and  $(-4, 3)$

### 3.5 Find the Slope and y- intercept of a Line Given an Equation

19.) Find the slope and y-intercept of the line for the equation  $y = \frac{1}{9}x + 7$

20.) Find the slope and y-intercept of the line for the equation  $-6x + 8y = -32$

### 3.5 Find the Slope of a Parallel Line and of a Perpendicular Line

21.) Find the slope of the line parallel to  $4x - y = 2$

22.) Find the slope of the line perpendicular to  $5x - 7y = 3$

### 3.6 Find the Average Rate of Change

23.) In 2008, there were 762 jobs in a small town. In 2012, there were 846 jobs in the town. Find the rate of change, in jobs per year, of new jobs from 2008 to 2012.

24.) In 2009, there were 879 jobs in a small town. In 2015, there were 423 jobs in the town. Find the rate of change, in jobs per year, of lost jobs from 2009 to 2015.

### 3.7 Write an Equation of a Line

25.) Write the equation of a line with slope of  $\frac{3}{10}$  and passing through the point  $(0, -2)$ . Write the equation in the form  $y = mx + b$ .

26.) Write the equation of a line passing through the points  $(-4, 7)$  and  $(3, -14)$ . Write the equation in the form  $y = mx + b$ .

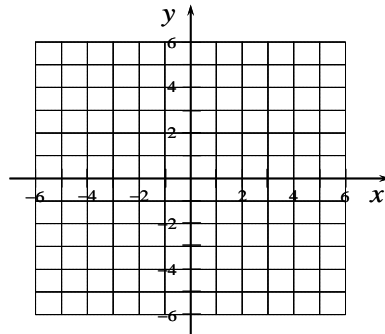
27.) Write the equation of a line parallel to  $y = -4x + 4$  and passing through the point  $(2, -13)$ . Write the equation in the form  $y = mx + b$ .

28.) Write the equation of a line perpendicular to  $y = -5x - 2$  and passing through the point  $(15, 2)$ . Write the equation in the form  $y = mx + b$ .

### 3.8 Draw a Scatter Plot and Trend Line

29.) Draw a scatter plot using the points in the table, and then sketch the line that best fits the data

x	y
-2	-3
-3	0
1	0
4	-1
2	1



### 3.8 Make a Prediction

30.) If the linear regression model for data on tuition and mid-career salary is

$$f(x) = -0.94x + 163$$

where  $x$  = annual tuition and  $f(x)$  = average mid-career salary of graduates, both in thousands of dollars, what is the average salary for a graduate of a university where the annual tuition is \$30,000?

### 3.8 Write an Equation and Make a Prediction

31a.) Courtney has been tracking the number of eagles she saw during four summers. In 2015, she saw 85 eagles. In 2016, she saw 90 eagles. In 2017 and 2018 she saw 100 and 106 eagles respectively. She found the data is approximately linear. Use the data from 2015 and 2018 to find an equation for the linear model. Use the variable  $t$  for the years after 2013 (so 2018 would be  $t=5$ ), where  $n(t)$  is the number of eagles seen.

31b.) Using the model from question 31a, predict the year in which she will see 162 eagles.

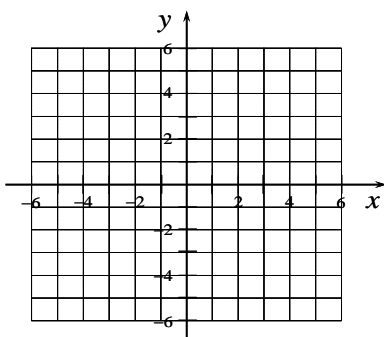
### Module 4 – Systems of Linear Equations

#### 4.1 Solve Systems of Equations by Graphing

32.) Solve the system by graphing:

$$-2x + y = -3$$

$$x + 2y = 4$$



#### 4.2 Solve Systems of Equations by the Substitution Method

33.) Solve the system by substitution:

$$x + 5y = -3$$

$$y = -2x + 12$$

34.) Solve the system by substitution:

$$-5x - 6y = 39$$

$$x = 2y + 5$$

35.) Solve the system by substitution:

$$-4x + y = 3$$

$$-16x + 4y = -14$$

#### 4.3 Solve Systems of Equations by the Addition/Elimination Method

36.) Solve the system by elimination:

$$x - 2y = -17$$

$$-2x + 2y = 16$$

37.) Solve the system by elimination:

$$3x = 5y - 28$$

$$-2(2x - y) = 14$$

38) Solve the system by elimination:

$$2x - 4y = -12$$

$$6x - 12y = -36$$

39.) Solve the system by elimination:

$$12x - 2y = 14$$

$$\frac{2}{7}x + \frac{2}{7}y = 2$$

#### 4.4 Solving Applications Using Systems of Linear Equations

40.) The sum of two numbers is 89. The difference of the two numbers is 33. What are the two numbers?

41.) You are choosing between two different cell phone plans. The first plan charges at rate of 22 cents per minute. The second plan charges a monthly fee of \$35.00 plus 8 cents per minute. How many minutes would you have to use in a month in order for the second plan to be preferable?

42.) Alan invested \$5,300 in two different accounts. The first account paid 5%; the second account paid 4% in interest. At the end of the first year, he had earned \$241 in interest. How much was invested in each account?



43.) The admission fee at an amusement park is \$10 for children and \$15.00 for adults. If one evening, 537 people attended, and \$6,265 was collected, how many children and how many adults were admitted?

44.) A store sells cashews for \$7.00 per pound and Brazil nuts for \$5.20 per pound. How much of each type should be used to make a 24 pound mixture that sells for \$6.25 per pound?

45.) How much of a 20% alcohol mixture and how much of a 65% alcohol mixture is needed to obtain 270 ounces of a 60% alcohol solution?

46.) An airplane travels 360 miles in 2 hours with the wind. The return trip against the wind takes 3 hours. What are the wind speed and the speed of the airplane in still air?