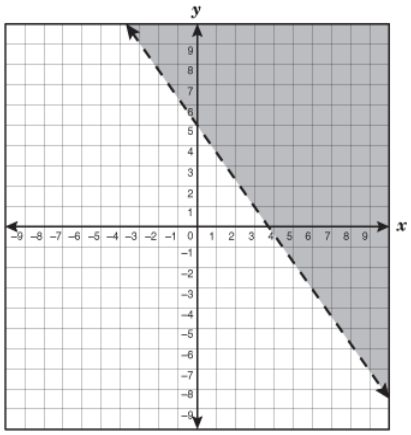
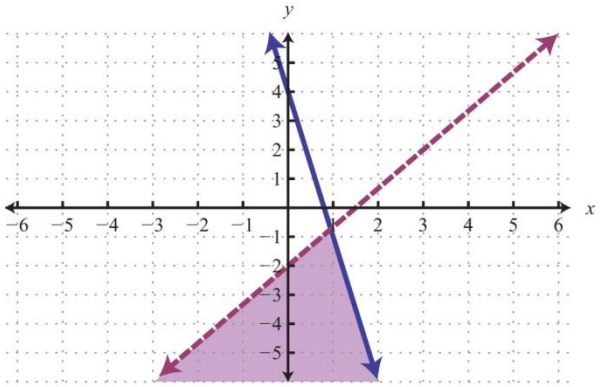
STATION #1 – *Linear Inequalities*

1. Write an inequality that represents the graph pictured below.



2. Write a system of inequalities that represent the graph pictured below.



3. A clothing manufacturer has 1000 yards of cotton to make shirts and pajamas. A shirt requires 1 yd. of fabric and a set of pajamas requires 2 yd. of fabric. It takes 2 hours to make a shirt and 3 hours to make a pair of pajamas, and there are only 1600 hours available to make the clothing.

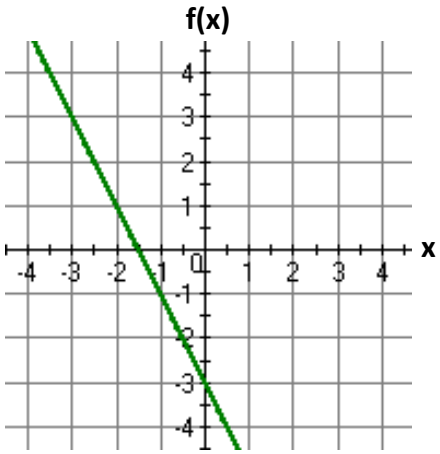
   a) Write a system of inequalities that can be used to determine the number of shirts, ***x***, and the number of sets of pajamas, ***y***, the clothing manufacturer can make given the constraints above.
   Helpful Hint: One inequality represents the amount of fabric used and the other represents the amount of hours it takes to produce the clothing.

   b) Using your system, determine if it is possible to make 300 shirts and 350 pairs of pajamas.

STATION #2 – *Function Notation and Sequences*

1. If $h(x) = x^4 - 5x$ then find $h(-1)$.

2. Consider the linear function **f(x)** shown here.



   a) Find the value of f(-2).

   b) For what value of x does f(x) = 3?

   c) For what value of x does f(x) = -3?

3. A soccer coach is getting her team ready for the season by introducing them to High Intensity Interval Training (HIIT). The table below represents a list of exercises for an HIIT training circuit and the length of time that must be spent on each exercise before the athlete gets a short time to rest. The rest time increases as the athletes complete more exercises in the circuit.

Exercise #	Length of Exercise Time	Length of Rest Time
Exercise 1	0. 5 minute	0. 25 minute
Exercise 2	0. 75 minute	0. 5 minute
Exercise 3	1 minute	1 minute
Exercise 4	1. 25 minutes	2 minutes
Exercise 5	1. 5 minutes	4 minutes

   a) Write an explicit rule to represent the amount of minutes spent exercising, ***E*(*n*)**, on the *n*th exercise.

   b) Write an explicit rule to represent the amount of minutes spent resting, ***R*(*n*)**, after the *n*th exercise.

4. Write the first four terms of the recursive sequence defined by the function below.

   $f(n) = 8 - \frac{1}{2} f(n-1)$ and $f(1) = 16$

STATION #3 – *Exponential Functions*

1. The number of visitors to a museum has been decreasing by approximately 3% each year since 2012. The number of visitors to the museum recorded in 2012 was 132,876 people.

   a) Write an equation that can be used to predict the number of visitors, ***V*(*t*)**, since 2012.

   b) What is the *decay rate*? _____ What is the *decay factor*? _____

   c) How many people are expected to visit the museum in 2017?

   d) In what year, would the number of people visiting the museum drop below 75,000?

2. Determine whether a *linear or exponential* model would best represent the situation presented.

   a) A man deposits $350 every two weeks into his savings account.

   b) The population of a species quadruples every year.

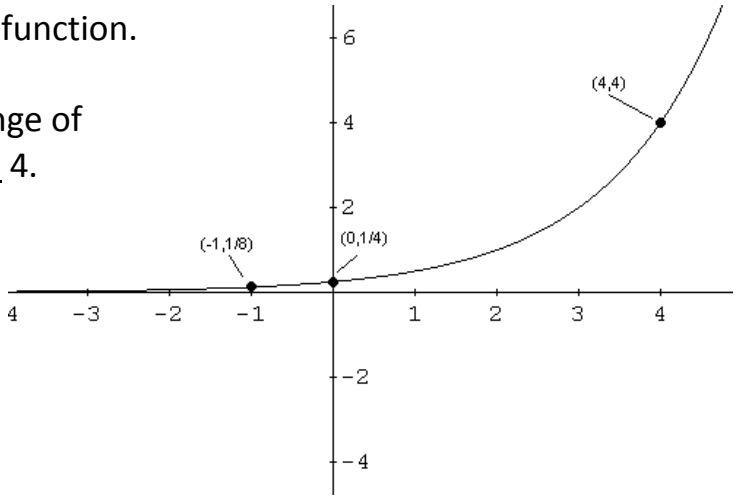
   c) A loan of $780 is accumulating interest annually at a rate of 7%.

3. Consider the graphs of $y = 7(1.2)^x$ and $y = 5(4)^x$. Which graph is growing at a faster rate? How do you know?

4. Consider the graph of the exponential function.

   a) Determine the average rate of change of the graph using the interval $-1 \leq x \leq 4$.

   b) Write an equation that represents the graph.



STATION #4 – *Factoring Polynomial Expressions*

1. Factor each polynomial expressions completely.

   a) $3x^4 - 21x^3 + 30x^2$ b) $x^4 - 13x^2 - 14$ c) $2x^8 - 32$

2. Which expressions are *not* equivalent to **$4x^2 - 12x - 40$**?

   A. $(x - 5)(x + 2)$ B. $4(x^2 - 3x - 10)$ C. $4x(x - 12 - 40)$

   D. $2(2x - 10)(x + 2)$ E. $(x - 5)(4x + 8)$ F. $4(x^2 - 2x - 5)$

3. If $x^2 + 2x + k = (x + 5)(x + p)$, then:

   (1) p = 3 and k = -5 (2) p = -5 and k = -3

   (3) p = -3 and k = 15 (4) p = -3 and k = -15

4. The factors of $a^2 + b^2$ are:

   (1) $(a + b)(a - b)$ (2) $a(a + b)$

   (3) $(a + b)(a + b)$ (4) *The expression cannot be factored*

5. Annie represented $p^4 - 1$ in factored form as $(p + 1)(p - 1)(p + 1)(p - 1)$.
   Do you agree or disagree with Annie? Explain your reasoning.