Math 2 NCFE Review #1 (Algebra)   Name: _____

1. Simplify $3xy(2xy^3 + x^2y^5) - 2x(x^2y^6 + 9y)$

2. Without using a calculator,

   a. identify the zeroes of $x^2+9x+18$

   b. determine the vertex

   c. construct a rough draft

3. The time it takes to fill a swimming pool varies proportionally with the rate of water flow. Suppose it takes 96 minutes to fill the pool when the flow rate is 18 gallons per minute. How long will it take to fill the pool if the flow rate is 24 gallons per minute?

4. Mary earned $63 for 6 hours of work. How much more will she make if she works a total of 10 hours?

5. The revenue for a concert is a function of the ticket price, x, and can be modeled by the function r(x)=-55x²+2035x-16500. The costs are also a function of the ticket price and can be modeled by c(x)=-27.5x+1842.5. For what ticket prices will the concert break even?

Math 2 NCFE Review #2 (Algebra)   Name: _____

1. John has a 20 foot ladder leaning against a wall. Create an equation that represents the relationship between the angle the ladder makes with the ground and the maximum height of ladder can reach against the wall.

Ladder 20 ft

h

θ
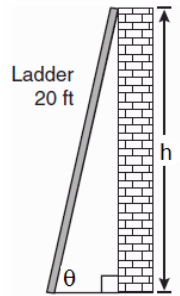
2. The FFA are selling trees and have determined that the number of trees they can buy depends on the price of the tree p, according to the function $n(p) = \dfrac{2400}{p}$. After allowing for profit, the number of trees that customers will purchase depends on the price which the group purchased the trees with function $c(p) = 300 - 6p$. For what price per tree will the number of trees that can be bought be greater than the number of trees that will be sold?

3. The formula $g = \dfrac{m_1 m_2}{d^2}$ is the gravitational force, g, between two objects given the mass, m, of each object and the distance, d, between the two objects. Solve the formula for the mass of the second object, m_2.

4. Solve each of the following:

   a. 5x²+12=87

   b. $5 = \dfrac{70}{x}$

   c. 4x²+13x-7=0

5. Ryan used the quadratic formula to solve an equation and his result was $x = \dfrac{8 \pm \sqrt{(-8)^2 - 4(1)(-2)}}{2(1)}$. Write the quadratic equation Ryan was solving.

Math 2 NCFE Review #3 (Algebra)   Name: _____

1. An investment account has an annual percentage rate of 9.2%.
   Determine an equivalent interest rate for each of the following:

   a. Monthly interest rate

   b. Weekly interest rate

   c. Daily interest rate

2. The area of a rectangle is 40 in². Write an equation for the length
   of the rectangle related to the width. Graph the length as it
   relates to the width of the rectangle.

3. Factor the expression $m^4 + 5m^2 + 4$

4. Given the graph of g(x),
   provide at least three
   solutions to g(x)=y
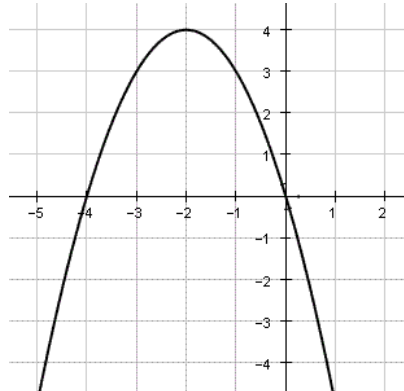
5. Given the following equations determine the x-value(s) that
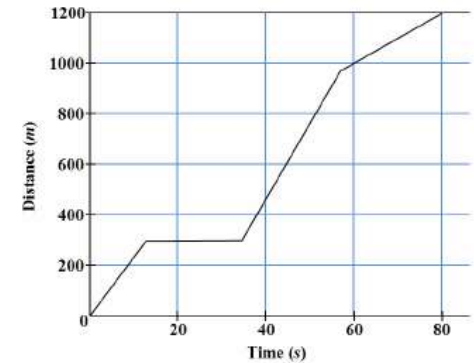   results in an equal output for both functions.

   f(x) = 3x – 2

   g(x) = (x + 3)² -1

Math 2 NCFE Review #4 (Functions) Name: _____

1. Find the value of k for $f(x) = 5x^2 + kx + 2$ if f(3)=23

2. The graph below shows
   the distance a car
   traveled for 80 seconds.

   Approximately how long
   was the car stationary?

3. A hotel has 10 stories above ground and 2 levels in its parking
   garage below ground. What is an appropriate domain for a
   function, T(n), that gives the average number of times an elevator
   in the hotel stops at the nth floor each day?

4. Graph $f(x) = \begin{cases} |x+4| & x<0 \\ 4-3x & 0 \le x < 1 \\ \sqrt{x} & x \ge 1 \end{cases}$ and describe the key features

5. Given the area of a triangle expressed by $\frac{1}{2}x^2 + 3x + 4$, write
   expressions for the base and the height of the triangle.

Math 2 NCFE Review #5 (Functions) Name: _____

1. Compare the graphs of y=sin x and y=cos x for 0°≤x≤180°.

2. What is the distance between the axis of symmetry for the two functions represented below?
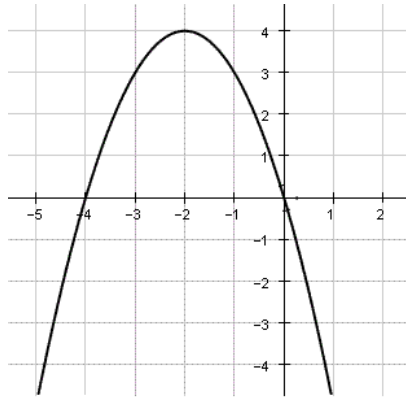
2x(x-6) - 11 = y +3x²

3. A petri dish has 2000 bacteria cells that grow at a rate of 1.2% every hour. Use the words NOW and NEXT to write a recursive function that can be used to calculate the number of bacteria for successive days.

4. The Sleek Bike Company repairs bicycles. The function $I(p) = -0.8x^2 - 1360x - 240$ represents the income as a function of the average price charged for repairs. The function $C(p) = 0.5x^2 - 6x + 200$ represents the company's monthly costs based on the average price charged for repairs. Build a function to represent the profit as a function of the average price charged for repairs.

5. The radius of a circular oil slick after t hours is given in feet by r =70t – 5 for 0 ≤ t ≤ 10. Find the area of the oil slick as a function of time.

Math 2 NCFE Review #6 (Functions) Name: _____

1. Jennifer graphs the function f(x)=x². Then she graphs the function f(x-3). How does the graph of f(x-3) differ from the graph of f(x)?

2. The equation g(x) = f(x+2) is graphed on a coordinate plane. Which equation, h(x), results from moving g(x) to the right 2 units and up 3 units?

    a. h(x) = f(x)

    b. h(x) = f(x) +2

    c. h(x) = f(x) +3

    d. h(x) = f(x+2) + 3

3. The height of a rocket, in feet, is modeled by the function h(t)= -(4t – 12)(4t – 36) where t is seconds. How long after reaching its maximum height does it take for the rocket to hit the ground?

4. A town council plans to build a public parking lot. The outline below represents the proposed shape of the parking lot. Write an expression for the area, in square feet, of this proposed parking lot.
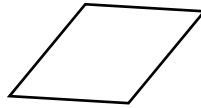

x yd.

x – 5 yd.

2x – 5 yd.

2x + 15 yd.
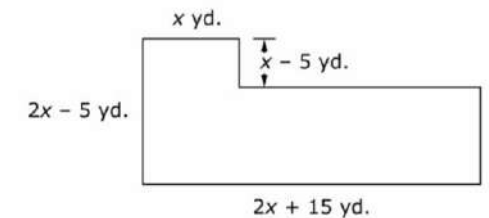
5. Determine whether each function is even, odd, or neither.

    a. f(x) = 4x + 5

   b. g(x) = x² - 9

    c. h(x) = (x – 4)²

    d. j(x) = 30 / x

Math 2 NCFE Review #7 (Geometry) Name: _____

1. Given a square graphed on a coordinate plane, describe how the transformation (x,y) -> (2x, 2y) affects the perimeter, area, and angles.
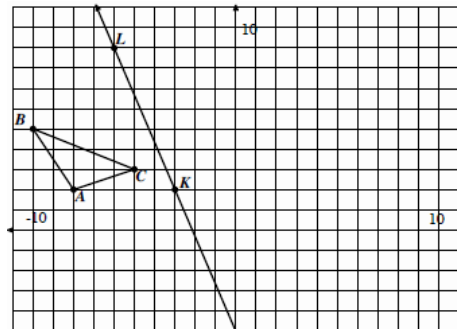
2. Describe the rotations and reflections that carry the given figure onto itself.

3. Describe the transformations that will map figure A to each of the other figures B, C, and D. Be as specific as possible.
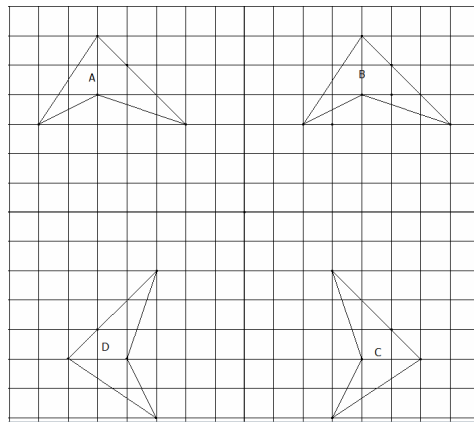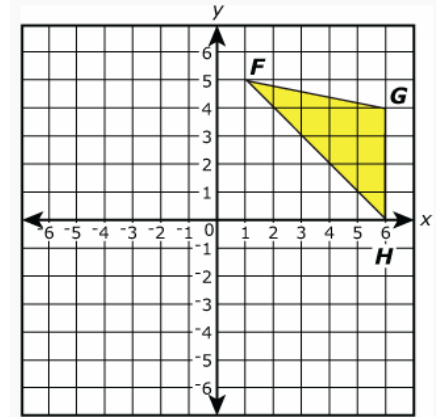
4. Reflect ΔABC across the line LK

5. Reflect across the x axis the parallelogram ABCD with coordinates A(2,-2), B(4,4), C(12,4) and D(10,-2). Make predictions about how the lengths, perimeter, area and angle measures will change.
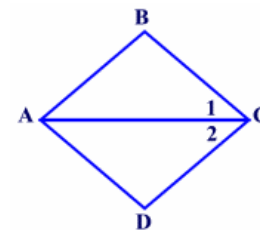
Math 2 NCFE Review #8 (Geometry) Name: _____

1. If triangle FGH is congruent to triangle FEH, find the coordinate of E.

2. If triangle *RST* is congruent to triangle *WXY*, by the Angle-Side-Angle Theorem, which transformation would **not** map triangle *RST* to triangle *WXY*?
    a. Horizontal shift 4 units left
    b. Reflection across the y axis
    c. Dilation with a scale factor of 3
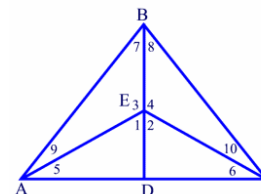   d. Rotation of 90° around the origin

3. Given: $\overline{BC} \cong \overline{CD}$
   $\overline{AC}$ bisects $\angle BCD$
   Prove: $\triangle ABC \cong \triangle ADC$

1. Given that $\angle 1 \cong \angle 2$ what additional information would be needed to prove $\triangle ABD \cong \triangle CBD$ by Angle-Side-Angle Theorem.
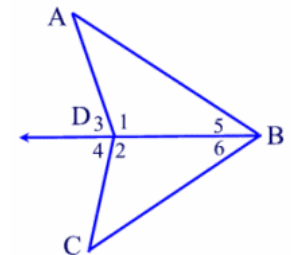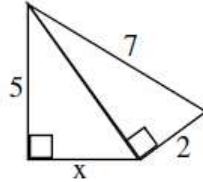
5. Given: $\angle 1 \cong \angle 2$
   $\angle 7 \cong \angle 8$
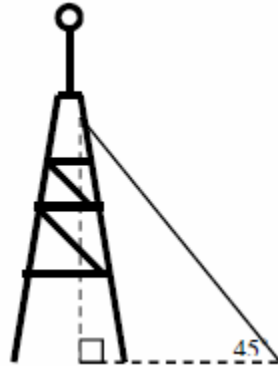   Prove: $\angle 5 \cong \angle 6$

Math 2 NCFE Review #9 (Geometry) Name: _____

1. Find a value for θ such that $\sin\theta = \cos 15°$.
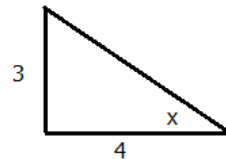
2. Find the perimeter of the figure.

3. A wire is positioned 145 feet up on a tower. It forms a 45° angle with the ground. What is the length of the wire?

4. To be safe, a ladder must lean 75° to the ground. If a ladder is 12' long, how high up the wall can it reach?

5. Find the sine, cosine, and tangent of x.

Math 2 NCFE Review #10 (Geometry)   Name: _____

1. A circle has a center at (1, 4) and a radius of 5. Is the point (2,2) on the circle?

2. Given directed line segment AB with A(-1,2) and B(7,14), find point P that partitions the segment into a ratio of 1:3.

3. Identify the three dimensional shape generated when the following object is rotated about the indicated line.
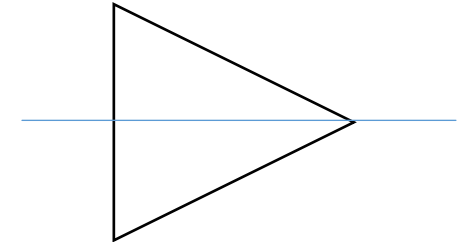
4. A King Size waterbed has the following dimensions 72 in. x 84 in. x 9.5in. It takes 240.7 gallons of water to fill it which would weigh 2071 pounds. What is the weight of a cubic foot of water?

5. You are the manager of a packing company responsible for manufacturing identical rectangular boxes from rectangular sheet of cardboard, each sheet having the same dimensions (18"x24"). To save money, you want to manufacture boxes that will have the maximum possible volume. You need to determine what size squares (all the same size) to cut out of each corner of the rectangular sheets to form a box (without a top) that will have the maximum volume.
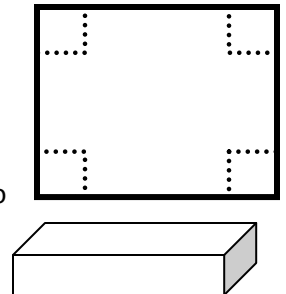
Math 2 NCFE Review #11 (Probability)   Name: _____

1. Andrea is shopping for a new cellphone. She is either going to contract
    with Verizon (60% chance) or with Sprint (40% chance). She must
    choose between an Android phone (25% chance) or an IPhone (75%
    chance). What is the probability Andrea will get an Android Phone with
    Verizon?

2. There are two identical bottles. A
    bottle is selected at random and a
    single ball is drawn. Use the tree
    diagram at the right to determine
    each of the following:

    a. What is P(red|bottle 1)?

    b. What is P(red|bottle 2)?
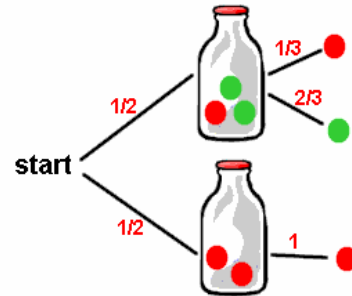
3. In a math class of 32 students, 18 boys and 14 are girls. On a unit test, 5
    boys and 7 girls made an A grade. If a student is chosen at random from
    the class, what is the probability of choosing a girl or an A student?

4. You have a box with 3 blue marbles, 2 red marbles, and 4 yellow
    marbles. You are going to pull out one marble, record its color, put it
    back in the box and draw another marble. What is the probability of
    pulling out a red marble followed by a blue marble?

5. Complete the two-way
    frequency table at the right
    and develop three conditional
    statements regarding the
    statements regarding the
    data. Determine if there are
    any set of events that independent. Justify your conclusion.

	Ice Cream	Cake	Total
Male		20	
Female	10		60
Total	85		