1. Along a straight shoreline, two lighthouses, *A* and *B*, are located 2000 feet apart. A buoy lies in view of both lighthouses, with angles 1, 2, and 3 as indicated. (Angle 1 is denoted by , angle 2 is denoted by , and angle 3 is denoted by .)

**A**

**B**

**2000**

**48o**

**2**

**1**

**3**

**C**



A. By looking at the picture, do you think  is an acute, obtuse, right, or straight angle?

B. What can you say about the relationship between and ?

C. If , what is the measurement for ? Show all work as to how you received your final answer.

2. The two parallel lines *a* and *b* are cut by a transversal *c*. Find the missing angles, and give a brief explanation as how you found each one.

1. 110o

 13 12

14 15

 17 16















3. A family decides to build a small basketball court in their backyard so their children can play at home. A concrete pad is to be poured that is ½ foot thick, and has dimensions of 15 feet by 15 feet. One cubic yard is equivalent to twenty-seven feet cubed. How many cubic yards of concrete must be poured? Round to the nearest cubic yard. Show all work to receive full credit.

4. The following picture shows a circular driveway with a flowerbed that lies in the middle. A family is planning to asphalt the driveway and knows the diameter of the whole circle is 20 feet and the radius of the circular flowerbed is 3 feet.

**3 ft**

**20 ft**

1. What is the area of the flowerbed? Show all work and round to the nearest hundredths place.
2. What is the area of the whole circle (the driveway and the flowerbed)? Show all work and round to the nearest hundredths place.

1. If the driveway costs $5.00 per square foot to asphalt, what will be the total cost to asphalt the driveway? Show all work and round to the nearest dollar.

5. Judy and Pete are building a new house and want to carpet their living room, except

for the entrance way and the semicircle in front of the fireplace that they want to tile

(Alexander & Koeberlein, 2003).

**4 ft**

**4 ft**

**6 ft**

**4 ft**

**4 ft**

**4 ft**

**6 ft**

**24 ft**

1. How many square yards of carpeting are needed? (**Hint:** There are 9 square feet in one square yard.) Round to the nearest yard. Show all work to receive full credit.
2. How many square feet are to be tiled? Show all work to receive full credit.

6. An observatory has the shape of a right circular cylinder topped by a hemisphere. The radius of the cylinder is 8 ft and its altitude measures 26 ft (Alexander & Koeberlein, 2003).



**26 ft**

**8 ft**

A. What is the approximate surface area of the observatory? Round to the nearest foot. Show all work to receive full credit. (**Hint:** Remember the top and bottom of the cylinder will not be painted, so do not include them in your surface area. However, note that the hemispherical dome will be painted.)

B. If 1 gallon of paint covers 300 ft2, how many gallons are needed to paint the surface if it requires three coats? Round up to the nearest gallon. Show all work to receive full credit.

7. Two angles are complimentary of each other. Twice one angle is equal to the other angle plus the product of three and five.

1. Set up a system of linear equations to represent the two angles. (**Hint:** You will need two equations and two unknowns.)

1. Graph each of the equations on one rectangular coordinate system. (**Hint:** You must get *y* by itself before graphing.) Scale the graph accordingly; you will need your *x-*axis and *y*-axis to go to at least 100.

1. What do you notice about the intersection of the two lines?
2. Solve the system of equations in part A to determine the degrees of each angle by using Gaussian elimination.

**Reference**

Alexander, D. C., & Koeberlein, G. M. (2003). *Elementary geometry for college students* (3rd ed.). Boston: Houghton Mifflin.