**Activity 4.4.3 Rational Expressions III**

In this activity, you will use what you know about the properties of geometric figures and simplifying rational expressions to answer the following questions.

1. Find an expression for the area of the square having a side length of .
2. Find an expression for the area of the triangle below.





1. Find expressions for the area and perimeter for the rectangle below.



Area:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Perimeter:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Find an expression for the perimeter of the quadrilateral.



 



1. The area for the rectangle below is . Find the length, L of the rectangle if the width is .



L

1. Find an expression for the perimeter for the rectangle in problem #5.
2. Find an expression for the height for the triangle below if the area is .

h



1. A rectangular prism has a height of *x*, a width of  and a length of .
   1. Find an expression for the volume of the prism.
   2. Find an expression for the surface area of the prism.
2. A cube has a side length of units.
   1. Find an expression for the volume of the cube.
   2. Find an expression for the surface area of the cube.
   3. Find the volume and surface area if x = 4 inches.
3. A paint can has a diameter of inches and a height of inches.
   1. Find an expression for the volume of the can.
   2. Find an expression for the surface area of the can.
4. Suppose b balls, numbered 1 to b, are placed in a container. Two of the balls that are in the container are winning balls. The container is shaken.

a. What is the probability of drawing a winning ball ?

b. Calculate the probability of drawing a winning ball if there are 100 balls in the container (b = 100). Then calculate for b = 10,000 and for b = 100,000.

c. As the number of balls increases, what happens to the probability of drawing a winning ball?

1. Suppose b balls, numbered 1 to b, are placed in a container. Two of the balls that are in the container are winning balls. The container is shaken. You now draw a first ball, replace it and draw again. What is the probability of drawing two winning balls?
2. Suppose b balls, numbered 1 to b, are placed in a container. Two of the balls that are in the container are winning balls. The container is shaken. You now draw a ball, do not replace it and draw a second ball. What is the probability of drawing two winning balls?
3. A. Ms Agnesi, a math teacher at a local high school is planning a field trip to the Connecticut Science Museum in Hartford. Bus transportation, parking and entrance fees will $1000 even with a museum discount. The total cost will be shared equally by all who go on the trip. She needs to at least have 30 students sign up but only has busses to transport 156 students and chaperones. She needs to have 5 chaperones go on the trip Write an expression to determine the cost per student/chaperone. Evaluate your expression for 50 and then 100 students/chaperones. What is the domain of this expression?

B. Students said they wanted to also attend an IMAX movie (see earlier part A of this problem) That was not part of the package. The discounted cost will be an additional $4 a student/chaperone. Write a new expression for the cost per person for this situation. See if you can take your expression and by manipulating it come up with an equivalent yet different expression.

C. Students thought it was unfair to have chaperones pay for the trip or movie. If 5 chaperones are needed, write an expression for the cost per student for trip and movie when chaperones pay $0.

D. Use your expression in part C to determine the cost per student when 50 students and 5 chaperones go on the trip, when 100 students and 5 chaperones go on the trip.

E. Students wanted to pay for the chaperones but thought most of them could afford no more than 12 dollars to go on the trip and see the movie. How many students would need to sign up to keep the cost per ticket no more than $12. Explain how you solved this problem.