**Activity 4.7.1 Irrational Square Roots in Standard Form**

Recall if *x*2 = 25 then since and . In geometry, we often only use the positive square root or principal square root. For this reason when talk about “square root” in this activity we are referring to the principal square root.

**Part I:**   
  
1. Evaluate each expression

a. b.

c. d.

e. f.

g. h.

2. Suppose *a* and *b* are any positive numbers. Which of these statements are always true? Sometimes true? Never true? (Look at the examples in question 1 and test with other values for *a* and *b*.)

a. . b. whenever *a*≥ *b.*

c. . d. Does

**Part II:**

Many times in mathematics we simplify square roots to make them simpler to approximate or to put it in a form that is helpful to finding patterns. For example, can be rewritten as or .   
  
3. Find another equivalent expression of as the product of two square roots. \_\_\_\_\_\_

In the case of the two factors where one is a perfect square, you can now simplify this expression and write it as .

4. Verify that = by finding a decimal approximation for each on your calculator.

5. Simplify each of the following square roots:

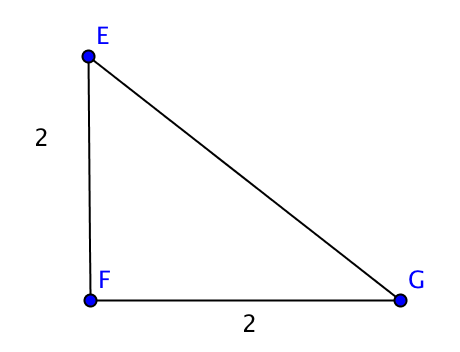
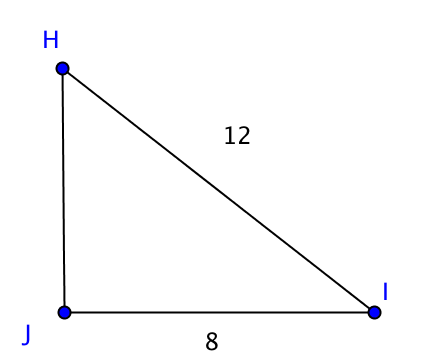
a. b. c.

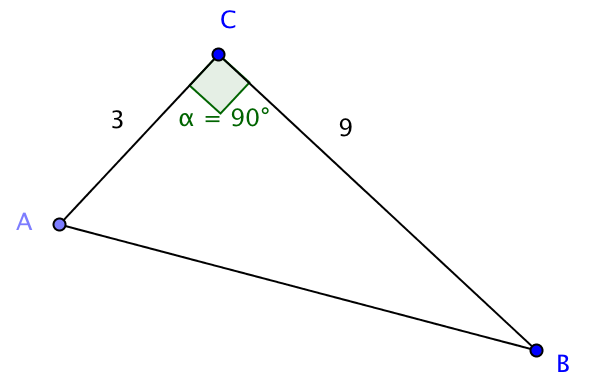
d. e.

**Part III:** Applying Simplified Square Roots

6. Solve for the missing side length of each right triangle and write your answer in simplified square root form.

a. b. c.





**Part IV:** Rationalizing a denominator.

Often we prefer not to have an expression with a square root in the denominator. We can often eliminate the square root by multiplying both numerator and denominator by the same number so that the denominator is “rationalized”

For example, = =

7. Verify that = by finding a decimal approximation for each on your calculator.

8. Simplify each of the following fractions by rationalizing the denominator:

a. b. c. d. e.