**5.1: Working with Radicals (Day 1)**

**Objectives:**

* Converting between mixed radicals and entire radicals
* Comparing and ordering radical expressions

Consider the number 25**:** 25 = 5**2** and 25 = (–5)**2**.

So, 25 has two square roots**:** 5 and –5. 5 is called the principal square root of 25.

If we are taking a square root of a number, we must consider both the **positive and negative** square roots.



i.e. if 

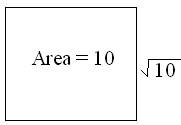










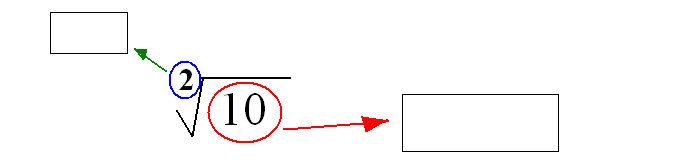
Consider a square with area of 10.

The side length of the square is positive, so it is the principal square root of 10; that is. Since 10 is not a perfect square, so  cannot be simplified and it is left



as a ***radical***.







**Convert Mixed Radicals to Entire Radicals**

**Example 1)** Express each mixed radical in entire radical form. Identify the values of the variable for which the radical represents a real number.





**Your Turn**





**Radicals in Simplest Form**



A radical is in simplest form if the following are true.

• The ***radicand*** does not contain a fraction or any factor that can be removed.

• The radical is not part of the denominator of a fraction.

For example,  is not in simplest form because 18 has a square factor of 9, which can be removed.  = =  is equivalent to the simplified form 3 .



**Express Entire Radicals as Mixed Radicals**

**Example 2)** Convert each entire radical to a mixed radical in simplest form.





**Compare and Order Radicals**

**Example 3)** Order the following numbers from least to greatest without a calculator.



