**5.1 – WORKING WITH RADICALS**

**Vocabulary:**



Note: When no index is shown, it’s assumed it is 2.

Radicals exist in 2 forms: Mixed or Entire. You can usually go from one form to the other.

**Mixed radicals** have a coefficient. Example:

**Entire radicals** don’t have a coefficient. Example .

**Writing radicals in Entire Form:**

Examples: a)

 b)

 c)

The only time we need to write radicals in entire form, is when we want to compare radicals without a calculator.

Example: **Order** these radicals without a calculator (which means, show your work!)
 5; ; ;

 🡪 You start by rewriting them all in entire form:

 ; ; ;

 Therefore,

**Writing radicals in simplified form (Part I):**

In square roots, you look for perfect squares, in cube roots, you look for perfect cubes…

Note: you need to be able to create a list of perfect squares or cubes fast with your calculator and at least know the first ones by heart…

Examples: a)

 b)

 c)

 d)
 e)
 f)

This form is the most useful, because it allows you to group like terms when adding radicals.

NOTES:

* The square root of a negative number isn’t defined. You can’t write . Therefore, if there is a variable in the radicand of a square root, we need to make sure the expression is defined by looking for possible restrictions on the variable.
For example, the expression only exists if *x* is positive or zero.
* doesn’t always equal *x*. It’s only true if *x* is positive or zero.
If *x* is négative, then .
Therefore, when we simplify an expression, we sometimes need to add restrictions to be allowed to do it…

Examples : a) only if
 b) is always true

**Adding Radicals:**

We call “like radicals”, radicals that have the same index and the same radicand.

Examples: and are like radicals.

 and are NOT like radicals

 and are NOT like radicals

When you’re adding terms, only like terms can be regrouped…

Examples: Simplify these expressions

 a)

 b)

 c)

 d) Determine AB:

 
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Your turn: p 277

Note: The final result isn’t simplified if you still can remove a perfect square from the radicand of a square root.

Hwk: p278 # 1 – 6, 8 – 11, 15, 17 – 20, 23 – 25.