**5.2 – MULTIPLYING AND DIVIDING RADICAL EXPRESSIONS**

**MULTIPLICATION AND DIVISION RULES :**

Examples :

1. $3\sqrt{2}×5\sqrt{5}=$
2. $2\sqrt{7x}×4\sqrt{75x^{3}}=$
3. $7\sqrt{3}\left(5\sqrt{5}-6\sqrt{3}\right)=$
4. $\left(8\sqrt{2}-5\right)\left(4-3\sqrt{2}\right)=$
5. $9\sqrt[3]{2x}\left(\sqrt[3]{8x^{2}}-3\right)=$
6. $\left(3\sqrt{5}-2\right)^{2}=$
7. $\left(3\sqrt{5}+1\right)\left(3\sqrt{5}-1\right)=$
8. $\frac{4\sqrt{6}}{12\sqrt{3}}=$

You always need to simplify your result…

**Simplest form of a radical:**

Definition: A radical is in simplest form if:

* There is no square root on the denominator and vice versa.
* no perfect power can be removed from the radicand.

Examples: $\sqrt{\frac{3}{5}}$; $\frac{2}{3\sqrt{5}}$; $\sqrt{50}$ aren’t in simplest form…

We have learned in 5.1 how to remove perfect powers from radicands. Now we’re going to learn how to deal with denominator issues.

That is called **rationalizing the denominator.**

The method depends on the number of terms on the denominator…

**RATIONALIZING THE DENOMINATOR :**

**Case # 1 : If there is only 1 term on the denominator**

Examples :

1. $\frac{5}{2\sqrt{3}}$
2. $\frac{\sqrt{2}-3}{5\sqrt{2}}$
3. $\frac{3}{5\sqrt[3]{2}}$

**Case # 2 : If there are 2 terms on the denominator.**

Example : $\frac{3}{5-\sqrt{2}}$

Definition: Two expressions are called **conjugate expressions** if their product is a difference of squares.

Reminder: $\left(a+b\right)\left(a-b\right)=a^{2}-b^{2}$

For example : $5-\sqrt{2}$ et $5+\sqrt{2}$ are conjugates. Et on a : $\left(5-\sqrt{2}\right)\left(5+\sqrt{2}\right)=25-2=23$

Examples of applications :

1. $\frac{2}{5-\sqrt{3}}$
2. $\frac{5\sqrt{3}}{4-2\sqrt{3}}$
3. $\frac{2\sqrt{3}+1}{2\sqrt{3}-1}$

Hwk : p 289 # 1 – 14, 16 – 20, 22 - 25