

9.3 ADDING AND SUBTRACTING RADICALS

In this section we look at rules for adding and subtracting radicals. This will be like adding like terms.

Like Terms:

$$3x + 5x = 8x$$

$$7x - 8x = -x$$

Like Radicals:

$$3\sqrt{2} + 5\sqrt{2} = 8\sqrt{2}$$

$$7\sqrt{2} - 8\sqrt{2} = -\sqrt{2}$$

EXAMPLE: Combine the following radicals

1.) $6\sqrt{3} + 7\sqrt{3} - 4\sqrt{3}$

2.) $8\sqrt{5} - 3\sqrt{5} + 7\sqrt{11} - 10\sqrt{11}$

3.) $3\sqrt{7} - 4\sqrt{6} + 3\sqrt{5} - 2\sqrt{7} + \sqrt{6}$

4.) $\sqrt{3} + \sqrt{3} + \sqrt{3}$

5.) $\sqrt[3]{4} + 4\sqrt[3]{4} - 8\sqrt[3]{4}$

6.) $6\sqrt{7} - 4\sqrt{10} - 6\sqrt{7}$

We know that $\sqrt{8} = 2\sqrt{2}$. So, $\sqrt{8} + \sqrt{2} = 2\sqrt{2} + \sqrt{2} = 3\sqrt{2}$. Therefore, we need to simplify our radicals before we add them.

EXAMPLE: Combine the following radicals:

1.) $3\sqrt{3} + \sqrt{27}$

2.) $5\sqrt{5} + 6\sqrt{20}$

3.) $2\sqrt{2} + 3\sqrt{5} + 4\sqrt{32} + 3\sqrt{125}$

4.) $\sqrt{44} + \sqrt{99} + \sqrt{11} + \sqrt{27}$

5.) $\sqrt[3]{32} + \sqrt[3]{4}$

6.) $2\sqrt[3]{24} + 5\sqrt[3]{81}$