

## Adding and Subtracting Radicals

Adding and subtracting radicals is like combining like terms.

$$\text{ex: } 6\sqrt{2} + 7\sqrt{2} = (6 + 7)\sqrt{2} = 13\sqrt{2}$$

If the radical parts are different, then the terms cannot be combined.

ex:  $\sqrt{2} + \sqrt{5}$  can't be simplified by addition because  $\sqrt{2}$  and  $\sqrt{5}$  are unlike radicals.

ex:  $\sqrt{7} + \sqrt[3]{7}$  can't be simplified by addition because the indices (2 and 3) are different.

### Ex 1.

Add or subtract whenever possible.

$$5\sqrt{10} - 7\sqrt{10}$$

$$\sqrt{5} + \sqrt{5}$$

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

$$2\sqrt{12} + 3\sqrt{75}$$

$$\sqrt{14} + \sqrt{17}$$

$$\sqrt{12x} + \sqrt{27x}$$

$$2\sqrt[3]{32x^3} - \sqrt[3]{108x^3}$$

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**Practice**

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1. Add or subtract whenever possible.

a)  $2\sqrt{11} - 6\sqrt{11}$

b)  $\sqrt{27} + \sqrt{12}$

c)  $3\sqrt[3]{16} + 5\sqrt[3]{2}$

d)  $x\sqrt{72} - \sqrt{18x^2}$

e)  $\sqrt[3]{81x^4} + 5\sqrt[3]{24x^4}$

Q: A man goes into a bar and asks for a glass of water. The barman pulls out a gun, and points it at the customer. "Thank you" replies the customer and walks out. What happened?