

Adding Radicals

Friday, February 14, 2020 10:39 AM

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

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

$$a^2 + b^2 \neq (a+b)^2$$

$$\sqrt{27} + \sqrt{75} \stackrel{?}{=} \sqrt{102}$$

$$5.19 + 8.66 \stackrel{?}{=} 10.1$$

$$13.85 \neq 10.1$$

$$3x + 4y = \text{Can't add together}$$

Not like terms

$$3\sqrt{3} + 4\sqrt{2} = \text{Can't add together}$$

Not like radicals

To add/subtract, combine like radicals

$$2\sqrt{2x} - 2\sqrt{2x} = 2z - 2z = 0$$

$$4\sqrt{3xy} - 8\sqrt{3xy^2} \text{ Not like radicals}$$

Ex 1 Simplify

$$\begin{aligned} \text{a) } \sqrt{27} + \sqrt{12} &= \sqrt{3^2 \cdot 3} + \sqrt{3 \cdot 2^2} \\ &\begin{array}{c} \wedge \\ 3 \quad 9 \\ \wedge \\ 3 \quad 3 \end{array} \quad \begin{array}{c} \wedge \\ 3 \quad 4 \\ \wedge \\ 2 \quad 2 \end{array} = 3\sqrt{3} + 2\sqrt{3} \\ &= \underline{\underline{5\sqrt{3}}} \end{aligned}$$

$$\begin{aligned} \text{b) } \sqrt[3]{16} - \sqrt[3]{24} - \sqrt[3]{54} & \\ &\begin{array}{c} \wedge \\ 4 \quad 4 \\ \wedge \quad \wedge \\ 2 \quad 2 \quad 2 \quad 2 \end{array} \quad \begin{array}{c} \wedge \\ 3 \quad 8 \\ \wedge \quad \wedge \\ 2 \quad 4 \\ \wedge \\ 2 \quad 2 \end{array} \\ &= \sqrt[3]{2^4} - \sqrt[3]{3 \cdot 2^3} - \sqrt[3]{27 \cdot 2} \\ &= 2 \sqrt[3]{2}^x - 2 \sqrt[3]{3}^y - 3 \sqrt[3]{2}^x \\ &= \underline{\underline{-\sqrt[3]{2} - 2\sqrt[3]{3}}} \end{aligned}$$

min work

$$c) \sqrt[3]{32x^5} - x \sqrt[3]{4x^2}$$

$$= \sqrt[3]{2^5 x^5} - x \sqrt[3]{2^2 x^2}$$

$$= 2x \sqrt[3]{2^2 x^2} - x \sqrt[3]{2^2 x^2} = 2xz - xz$$

$$= \underline{x \sqrt[3]{4x^2}}$$

$$d) \sqrt{32x} + \sqrt{48y} - \sqrt{12x} + \sqrt{27y}$$

$$\begin{array}{cc} \text{A} & \text{A} \\ 4 & 6 \\ 8 & 8 \\ \wedge & \wedge \\ 2 & 2 \\ 2 & 3 \\ 2 & 2 \\ 4 & 4 \\ \wedge & \wedge \\ & 2 \\ & 2 \end{array}$$

$$= \sqrt{2^5 \cdot x} + \sqrt{2^4 \cdot 3 \cdot y} - \sqrt{4 \cdot 3 \cdot x} + \sqrt{3^3 \cdot y}$$

$$= 4\sqrt{2x} + 4\sqrt[3]{3y} - 2\sqrt{3x} + 3\sqrt[3]{3y}$$

$$= \underline{4\sqrt{2x} - 2\sqrt{3x} + 7\sqrt{3y}}$$