

Adding Radicals

Friday, February 14, 2020 10:39 AM

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

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

$$3x + 4y \Rightarrow \text{Can't simplify/add}$$

Not like terms

$$3\sqrt{3} + 4\sqrt{2} \Rightarrow \text{Can't simplify/add}$$

Not like radicals

NB:

$$(2+x)^2 \neq 2^2 + x^2$$

$$3\sqrt{3} + 5\sqrt{3} = \sqrt{27} + \sqrt{75} \neq \sqrt{27+75}$$

$$\sqrt{3 \cdot 5^2} \quad 5.19 + 8.66 \neq 10.1$$

$$13.85 \neq 10.1$$

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Like radicals

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

$$5\sqrt{2x} - 3\sqrt{3x} \quad \text{not like radicals}$$

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Ex 1 Simplify

$$\begin{aligned} \text{a) } \sqrt{27} + \sqrt{12} &= \sqrt{3^2 \cdot 3} + \sqrt{2^2 \cdot 3} \\ &= 3\sqrt{3} + 2\sqrt{3} \\ &= 5\sqrt{3} \end{aligned}$$

$$\begin{aligned} \text{b) } \sqrt[3]{16} - \sqrt[3]{24} - \sqrt[3]{54} \\ &= \sqrt[3]{2^4} - \sqrt[3]{2^3 \cdot 3} - \sqrt[3]{27 \cdot 2} \\ &= 2\sqrt[3]{2} - 2\sqrt[3]{3} - 3\sqrt[3]{2} \\ &= -\sqrt[3]{2} - 2\sqrt[3]{3} \end{aligned}$$

Handwritten notes: "Fine" and "min" with arrows pointing to the terms $\sqrt[3]{3}$ and $\sqrt[3]{2}$ respectively.

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



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

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

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

$$= \sqrt{2^5 \cdot x} + \sqrt{16 \cdot 3 \cdot y} - \sqrt{4 \cdot 3 \cdot x} + \sqrt{9 \cdot 3 \cdot y}$$

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

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