

Unit 4: Radical Expressions & Equations

4.3 Adding & Subtracting Radical Expressions

Recall (from 5.1A):

Like Radicals – radicals with same index & radicand
– differ only by their coefficients

Adding & Subtracting radical expressions similar to adding & subtracting algebraic terms.

Recall:

$$\begin{aligned} & \cancel{5x} - \cancel{8y} + 14x + \cancel{25} + 20y \\ &= 19x + 12y + 25 \end{aligned}$$

ex. Simplify:

$$\begin{aligned} \text{a) } & 2\sqrt{7} - 13\sqrt{7} \\ &= \boxed{-11\sqrt{7}} \end{aligned}$$

$$\begin{aligned} \text{b) } & \sqrt{24} - \sqrt{6} \\ &= 2\sqrt{6} - \sqrt{6} \\ &= \boxed{\sqrt{6}} \end{aligned}$$

$$\begin{aligned} \text{c) } & \sqrt{4c} - 4\sqrt{9c}, \underline{c \geq 0} \\ &= 2\sqrt{c} - 4(3\sqrt{c}) \\ &= 2\sqrt{c} - 12\sqrt{c} \\ &= \boxed{-10\sqrt{c}} \end{aligned}$$

$$\begin{aligned} \text{d) } & -\sqrt{27} + 3\sqrt{5} - \sqrt{80} - 2\sqrt{12} \\ & \quad \quad \quad \begin{matrix} 9 \cdot 3 & & & 16 \cdot 5 & & 4 \cdot 3 \end{matrix} \\ &= -3\sqrt{3} + 3\sqrt{5} - 4\sqrt{5} - 4\sqrt{3} \\ &= \boxed{-7\sqrt{3} - \sqrt{5}} \end{aligned}$$

$$\text{e) } \sqrt{20x^3} - 3\sqrt{45x}, \quad x \geq 0$$

$$\begin{matrix} 4 \cdot 5 x^2 x & & 9 \cdot 5 x \end{matrix}$$

$$\begin{aligned} & 2x\sqrt{5x} - 9\sqrt{5x} \\ &= \boxed{(2x - 9)\sqrt{5x}} \end{aligned}$$

$$\text{f) } \sqrt[3]{54} + 5\sqrt[3]{16} - \sqrt[3]{50}$$

$$\begin{matrix} 27 \cdot 2 & & 8 \cdot 2 \end{matrix}$$

$$\begin{aligned} &= 9\sqrt[3]{2} + 10\sqrt[3]{2} - \sqrt[3]{50} \\ &= \boxed{19\sqrt[3]{2} - \sqrt[3]{50}} \end{aligned}$$

Practice: pg. 279/ #8 – 10(cd), 13, 15, 16, 18, 19, 23,
& Worksheet(210) – on sheet