

Opener  
Simplify:

$$\textcircled{1} \sqrt{121x^3}$$

$$\sqrt{121x^2 \cdot x}$$

$$\boxed{11x\sqrt{x}}$$

$$\textcircled{2} \sqrt{7x} \cdot 7\sqrt{x}$$

$$7\sqrt{7x^2}$$

$$\boxed{7x\sqrt{7}}$$

$$\textcircled{3} \sqrt{\frac{5}{x^2}} = \frac{\sqrt{5}}{\sqrt{x^2}} = \boxed{\frac{\sqrt{5}}{x}}$$

$$\textcircled{4} 3\sqrt{2} - \sqrt{128}$$

$$3\sqrt{2} - \sqrt{64 \cdot 2}$$

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

$$\boxed{-5\sqrt{2}}$$

$$\textcircled{6} \sqrt{2}(7 - \sqrt{6})$$

$$7\sqrt{2} - \sqrt{12}$$

$$7\sqrt{2} - \sqrt{4 \cdot 3}$$

$$\boxed{7\sqrt{2} - 2\sqrt{3}}$$

Adding & Subtracting Fractions w/ Radicals

$$\textcircled{1} \frac{5\sqrt{9}}{\sqrt{3}\sqrt{9}} + \frac{6}{\sqrt{27}}$$

$$\frac{5\sqrt{9}}{\sqrt{27}} + \frac{6}{\sqrt{27}}$$

$$\frac{5 \cdot 3 + 6}{\sqrt{27}}$$

$$\frac{15+6}{\sqrt{9 \cdot 3}} = \frac{21}{3\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$$

$$= \frac{21\sqrt{3}}{3 \cdot 3}$$

$$= \frac{21\sqrt{3}}{9} = \boxed{\frac{7\sqrt{3}}{3}}$$

$$\textcircled{2} \frac{2\sqrt{5}\sqrt{4}}{\sqrt{30}\sqrt{4}} - \frac{3\sqrt{3}}{\sqrt{40}\sqrt{3}}$$

$$\frac{2\sqrt{20}}{\sqrt{120}} - \frac{3\sqrt{3}}{\sqrt{120}}$$

$$\frac{2\sqrt{4 \cdot 5} - 3\sqrt{3}}{\sqrt{4 \cdot 30}}$$

$$\frac{2 \cdot 2\sqrt{5} - 3\sqrt{3}}{2\sqrt{30}}$$

$$\frac{(4\sqrt{5} - 3\sqrt{3}) \cdot \sqrt{30}}{2\sqrt{30} \cdot \sqrt{30}}$$

$$\frac{4\sqrt{150} - 3\sqrt{90}}{2 \cdot 30} = \frac{4\sqrt{25 \cdot 6} - 3\sqrt{9 \cdot 10}}{60}$$

$$\textcircled{4} \frac{5\sqrt{x^2}}{\sqrt{x}\sqrt{x^2}} - \frac{7\sqrt{x}}{\sqrt{x^3}}$$

$$\frac{5\sqrt{x}}{\sqrt{x} \cdot \sqrt{x}} - \frac{7\sqrt{x}}{\sqrt{x} \cdot \sqrt{x}}$$

$$\textcircled{5} \frac{\sqrt{7}}{\sqrt{x^5}} - \frac{x}{\sqrt{x^3}} \cdot \frac{\sqrt{x^2}}{\sqrt{x^2}}$$

$$\frac{\sqrt{7}}{\sqrt{x} \cdot \sqrt{x^2}} - \frac{x \cdot \sqrt{x^2}}{\sqrt{x} \cdot \sqrt{x^2}}$$

$$= \frac{\sqrt{7}}{\sqrt{x} \cdot x} - \frac{x \cdot x}{\sqrt{x} \cdot x}$$

$$= \frac{\sqrt{7}}{x\sqrt{x}} - \frac{x^2}{x\sqrt{x}}$$

$$= \frac{\sqrt{7} - x^2}{x\sqrt{x}}$$

$$x \sqrt{x^3}$$

$$\frac{5\sqrt{x^2}}{\sqrt{x^3}} - \frac{7\sqrt{x}}{\sqrt{x^3}}$$

$$\frac{5x - 7\sqrt{x}}{\sqrt{x^2 \cdot x}}$$

$$\frac{(5x - 7\sqrt{x}) \cdot \sqrt{x}}{x\sqrt{x} \cdot \sqrt{x}}$$

$$\frac{5x\sqrt{x} - 7x}{x \cdot x}$$

$$\frac{x(5\sqrt{x} - 7)}{x^2}$$

$$\boxed{\frac{5\sqrt{x} - 7}{x}}$$

$$\sqrt{x^5} - \sqrt{x^3} \sqrt{x^2}$$

$$\frac{\sqrt{7}}{\sqrt{x^5}} - \frac{x\sqrt{x^2}}{\sqrt{x^5}}$$

$$\frac{\sqrt{7} - x \cdot x}{\sqrt{x^5}}$$

$$\frac{\sqrt{7} - x^2}{\sqrt{x^4 \cdot x}}$$

$$\frac{(\sqrt{7} - x^2) \cdot \sqrt{x}}{x^2 \sqrt{x} \cdot \sqrt{x}} = \boxed{\frac{\sqrt{7x} - x^2 \sqrt{x}}{x^3}}$$

$$\frac{20\sqrt{6} - 9\sqrt{10}}{60}$$