

Operations with Radical Expressions

What is the simplified form of each expression?

$$\textcircled{1} \sqrt{5} - 8\sqrt{5}$$
$$\underline{-7\sqrt{5}}$$

$$\textcircled{2} 4\sqrt{7} + 2\sqrt{28}$$
$$4\sqrt{7} + 2\sqrt{4 \cdot 7}$$
$$4\sqrt{7} + 4\sqrt{7}$$
$$\underline{8\sqrt{7}}$$

$$\textcircled{3} (\sqrt{6} - 2\sqrt{3})(4\sqrt{3} + 3\sqrt{6}) \leftarrow \text{FOIL}$$
$$4\sqrt{18} + 3\sqrt{36} - 8\sqrt{9} - 6\sqrt{18}$$
$$4 \cdot \sqrt{9} \cdot \sqrt{2} + 3 \cdot 6 - 8 \cdot 3 - 6 \sqrt{9} \cdot \sqrt{2}$$
$$4 \cdot 3 \cdot \sqrt{2} + 18 - 24 - 6 \cdot 3 \cdot \sqrt{2}$$
$$12\sqrt{2} + 18 - 24 - 18\sqrt{2}$$
$$\underline{-6\sqrt{2} - 6}$$

Rationalize the denominator.

$$\textcircled{4} \frac{10}{\sqrt{7}-\sqrt{2}} \cdot \frac{\sqrt{7}+\sqrt{2}}{\sqrt{7}+\sqrt{2}} \text{ conjugate}$$
$$\frac{10(\sqrt{7}+\sqrt{2})}{7-2}$$
$$\frac{10(\sqrt{7}+\sqrt{2})}{5}$$
$$2(\sqrt{7}+\sqrt{2})$$
$$\underline{2\sqrt{7}+2\sqrt{2}}$$

Find the solution, Round-Tenths

$$\textcircled{5} \frac{1+\sqrt{5}}{2} = \frac{4}{w}$$
$$\frac{w(1+\sqrt{5})}{1+\sqrt{5}} = \frac{8}{1+\sqrt{5}} \cdot \frac{1-\sqrt{5}}{1-\sqrt{5}}$$
$$= \frac{8(1-\sqrt{5})}{1-5}$$
$$= \frac{8(1-\sqrt{5})}{-4}$$
$$= -2(1-\sqrt{5})$$
$$= -2 + 2\sqrt{5} \approx \underline{2.5}$$