

Operations 9/21

Simplify:

$$(3 - \sqrt{7})(8 + \sqrt{7})$$

FOIL



$$24 + 3\sqrt{7} - 8\sqrt{7} - \sqrt{49}$$

$$24 + 3\sqrt{7} - 8\sqrt{7} - 7$$

$$17 - 5\sqrt{7}$$

② Simplify and collect like terms.

$$(-3\sqrt{3})(9-7\sqrt{3})$$

$$9 - 7\sqrt{3} + 27\sqrt{3} - 21\sqrt{9}$$
$$-21 \cdot 3$$

$$9 - 7\sqrt{3} + 27\sqrt{3} - 63$$

$$-54 + 20\sqrt{3}$$



$$\frac{\sqrt{9}}{\sqrt{4}} = \sqrt{\frac{9}{4}}$$
$$= \boxed{\frac{3}{2}}$$

$$\sqrt{\frac{8}{9}} = \frac{\sqrt{8}}{\sqrt{9}} = \frac{\sqrt{4 \cdot 2}}{3} = \frac{2\sqrt{2}}{3}$$

$$\frac{\sqrt{20}}{2\sqrt{4}} = \frac{\sqrt{4 \cdot 5}}{2 \cdot 2} = \frac{2\sqrt{5}}{4 \div 2} = \boxed{\frac{\sqrt{5}}{2}}$$

$$\frac{5\sqrt{6}}{5\sqrt{3}} = \frac{\sqrt{6}}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{18}}{\sqrt{9}} = \frac{\sqrt{9 \cdot 2}}{3} = \frac{3\sqrt{2}}{3} = \sqrt{2}$$

Rationalize

* NO radicals in the Denominator *

$$\frac{4\sqrt{3}}{5\sqrt{6}} = \frac{4}{5} \cdot \sqrt{\frac{3}{6}}$$

$$\frac{4}{5} \cdot \sqrt{\frac{1}{2}} = \frac{4}{5} \cdot \frac{1}{\sqrt{2}} = \frac{4}{5} \frac{\sqrt{2}}{\sqrt{2}} = \frac{4\sqrt{2}}{5 \cdot 2}$$

$$\frac{4\sqrt{2}}{10} = \boxed{\frac{2\sqrt{2}}{5}}$$

$$\frac{\sqrt{2}}{(2 - \sqrt{2})(2 + \sqrt{2})}$$

Conjugate

$$\frac{2\sqrt{2} + 2}{4 + \cancel{2\sqrt{2}} - \cancel{2\sqrt{2}} - 2} = \frac{2 + 2\sqrt{2}}{2}$$

$$\frac{1 + \sqrt{2}}{1} = \boxed{1 + \sqrt{2}}$$

Conjugates

$$-3 + \sqrt{2} \quad -3 - \sqrt{2}$$

$$-2 - \sqrt{5} \quad -2 + \sqrt{5}$$

$$\begin{array}{r}
 \sqrt{2} \quad (4 - 3\sqrt{2}) \\
 \hline
 4 + 3\sqrt{2} \quad (4 - 3\sqrt{2}) \\
 \hline
 4\sqrt{2} - 3\sqrt{4} = \frac{4\sqrt{2} - 6}{-2} = -2\sqrt{2} + 3 \\
 \begin{array}{r}
 16 - 12\sqrt{2} + 12\sqrt{2} - 9\sqrt{4} \\
 16 - 18 \quad -9 \cdot 2
 \end{array}
 \end{array}$$