

Dividing Radicals

Friday, February 7, 2020 1:04 PM

$$\frac{\sqrt{36}}{\sqrt{4}} = \frac{6}{2} = 3 \quad \frac{\sqrt{36}}{\sqrt{4}} = \sqrt{\frac{36}{4}} = \sqrt{9} = 3$$

$$\frac{\sqrt{20}}{\sqrt{5}} = \sqrt{\frac{20}{5}} = \sqrt{4} = 2$$

$$\frac{\sqrt{64}}{\sqrt{2}} = \sqrt{\frac{64}{2}} = \sqrt{32} = \sqrt{16 \cdot 2} = 4\sqrt{2}$$

$$\frac{\sqrt{64}}{\sqrt{2}} = \frac{8}{\sqrt{2} \cdot \sqrt{2}} = \frac{8\sqrt{2}}{2} = 4\sqrt{2}$$

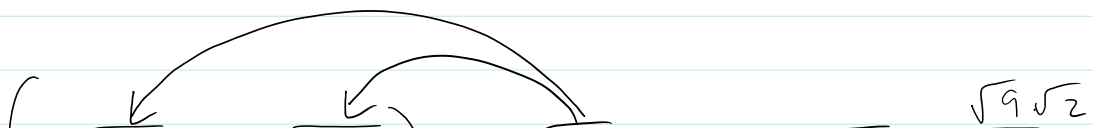
$$\frac{\sqrt{5}}{\sqrt{27}} = \frac{\sqrt{5}}{\sqrt{9 \cdot 3}} = \frac{\sqrt{5}}{3\sqrt{3} \cdot \sqrt{3}} = \frac{\sqrt{15}}{9}$$

$$\frac{\sqrt{5}}{\sqrt{27}} \cdot \frac{\sqrt{27}}{\sqrt{27}} = \frac{\sqrt{135}}{27} = \frac{\sqrt{9 \cdot 15}}{27} = \frac{3\sqrt{15}}{27} = \frac{\sqrt{15}}{9}$$

Try $\frac{8\sqrt{27}}{3\sqrt{72}} = \frac{8\sqrt{9}\sqrt{3}}{3\sqrt{36}\sqrt{2}} = \frac{24\sqrt{3} \cdot \sqrt{2}}{18\sqrt{2} \cdot \sqrt{2}} = \frac{24\sqrt{6}}{36} = \frac{2\sqrt{6}}{3}$

$$\frac{8\sqrt{9}\sqrt{3}}{3\sqrt{9}\sqrt{4}} = \frac{24\sqrt{3} \cdot \sqrt{3}}{9\sqrt{8} \cdot \sqrt{8}} = \frac{24\sqrt{24}}{72} = \frac{48\sqrt{6}}{72} = \frac{2\sqrt{6}}{3}$$

$$\frac{8\sqrt{27^3}}{3\sqrt{72^8}} = \frac{8\sqrt{3}}{3\sqrt{8}}$$



$$\frac{(5\sqrt{2} - \sqrt{6}) \cdot \sqrt{3}}{\sqrt{3} \cdot \sqrt{3}} = \frac{5\sqrt{6} - \sqrt{18}}{3}$$

$$= \frac{5\sqrt{6} - 3\sqrt{2}}{3}$$

$$\frac{5+4}{2} = \frac{9}{2}$$

~~$$\frac{5+4^2}{2} = 7$$~~

Try $\frac{8\sqrt{2} - 4\sqrt{5}}{\sqrt{20}} = \frac{8\sqrt{2} - 4\sqrt{5}}{2\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}}$

$$= \frac{4\sqrt{10} - 20}{10} = \frac{4\sqrt{10} - 10}{5}$$

Simplify: $\frac{\sqrt{5}(\sqrt{2} + \sqrt{3})}{(\sqrt{2} - \sqrt{3})(\sqrt{2} + \sqrt{3})} = \frac{\sqrt{10} + \sqrt{15}}{2 + \sqrt{6} - \sqrt{6} - 3}$

$$= \frac{\sqrt{10} + \sqrt{15}}{-1}$$

is called the conjugate = $-\sqrt{10} - \sqrt{15}$

which is the same 2 terms with the opposite sign between them.

Try $\frac{2\sqrt{3} + 3\sqrt{5}}{(3\sqrt{3} - 2\sqrt{5})(3\sqrt{3} + 2\sqrt{5})}$

$$= \frac{6(3) + 4\sqrt{15} + 9\sqrt{15} + 6(5)}{(9-12) \cdot (9-12)}$$

$$\frac{3\sqrt{3} \cdot 3\sqrt{3}}{9-12}$$

$$= \frac{6(3) + 4\sqrt{15} + 9\sqrt{15} + 6(5)}{(3\sqrt{3})^2 - (2\sqrt{5})^2}$$

$$\frac{3\sqrt{3} \cdot 3\sqrt{3}}{9 \cdot 3}$$

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

$$= \frac{18 + 13\sqrt{15} + 30}{27 - 20}$$

$$= \frac{48 + 13\sqrt{15}}{7}$$

$29^{122-128}$
 9^{10}
 $\# 6, 12, 16$

$$10a) \frac{-\sqrt{5}(\sqrt{7}+3)}{(\sqrt{7}-3)(\sqrt{7}+3)} = \frac{-\sqrt{35} - 3\sqrt{5}}{(\sqrt{7})^2 - 3^2} = \frac{-\sqrt{35} - 3\sqrt{5}}{7 - 9} = \frac{-\sqrt{35} - 3\sqrt{5}}{-2} = \frac{\sqrt{35} + 3\sqrt{5}}{2}$$

$$10a) \frac{(6\sqrt{3}-2)(5-4\sqrt{2})}{(5+4\sqrt{2})(5-4\sqrt{2})} = \frac{30\sqrt{3} - 24\sqrt{6} - 10 + 8\sqrt{2}}{5^2 - (4\sqrt{2})^2} = \frac{30\sqrt{3} - 24\sqrt{6} - 10 + 8\sqrt{2}}{25 - 32} = \frac{-30\sqrt{3} + 24\sqrt{6} + 10 - 8\sqrt{2}}{7}$$

$$12b) \frac{2}{\sqrt{5}-1} - \frac{\sqrt{5}-1}{2}$$

$$13a) \frac{1 \cdot \sqrt{5}}{\sqrt{5} \cdot \sqrt{5}} - \frac{1 \cdot \sqrt{3}}{\sqrt{3} \cdot \sqrt{3}} = \frac{\sqrt{5} \cdot 3}{5 \cdot 3} - \frac{\sqrt{3} \cdot 5}{3 \cdot 5}$$

$$\frac{3\sqrt{5}}{15} - \frac{5\sqrt{3}}{15} = \frac{3\sqrt{5} - 5\sqrt{3}}{15}$$

$$iii) \frac{\sqrt{6}(2\sqrt{5}-3\sqrt{3})}{(2\sqrt{5}+3\sqrt{3})(2\sqrt{5}-3\sqrt{3})} - \frac{\sqrt{2}(\sqrt{7}+2\sqrt{3})}{(\sqrt{7}-2\sqrt{3})(\sqrt{7}+2\sqrt{3})}$$

$2\sqrt{30} - 3\sqrt{14}$ $\sqrt{14} + 2\sqrt{6}$

$$\frac{2\sqrt{30} - 3\sqrt{18}}{20 - 27} - \frac{\sqrt{14} + 2\sqrt{6}}{7 - 12}$$

$$-5 \cdot \frac{2\sqrt{30} - 9\sqrt{2}}{-5} - \frac{\sqrt{14} + 2\sqrt{6}}{-5} \cdot -7$$

$$\frac{-10\sqrt{30} + 45\sqrt{2}}{35} - \frac{-7\sqrt{14} - 14\sqrt{6}}{35}$$

$$\frac{-10\sqrt{30} + 45\sqrt{2} + 7\sqrt{14} + 14\sqrt{6}}{35}$$

$$\frac{\sqrt{4} \cdot \sqrt{9}}{\sqrt{36}} \quad \frac{\sqrt{4}}{\sqrt{9}} = \frac{2}{3}$$

$$\frac{\sqrt{3} \cdot \sqrt{5}}{\sqrt{15}} \quad \frac{\sqrt{3}}{\sqrt{5}} \quad \frac{3}{(\sqrt{2})^2} \cdot \frac{\sqrt{2}}{\sqrt{2}}$$

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

$$= \frac{3\sqrt[3]{2}}{2}$$

$$\frac{3}{\sqrt[3]{5}} \cdot (\sqrt[3]{5})^2$$

$$(\sqrt[3]{4})^2$$

$$\sqrt[3]{16}$$

$$\sqrt[3]{8} \cdot \sqrt[3]{2}$$

$$2\sqrt[3]{2}$$