Quiz 7.4

1 (2 points) Add or subtract as indicated.

$$4\sqrt[3]{5}-3\sqrt{5}+7\sqrt[3]{5}-8\sqrt{5}$$

2 (2 points) Add or subtract as indicated. Assume all variables are positive or zero.

$$\sqrt{12x^2}+3x\sqrt{2}-2\sqrt{98x^2}$$

3 (2 points) Multiply and simplify. Assume all variables are positive or zero.

$$\left(\sqrt{x}-\sqrt{2}\right)^2$$

7.5 Rationalizing Radical Expressions

Rationalize the denominator of each expression:
Assume all variables are positive.

$$\frac{1}{\sqrt{7}}\cdot\frac{\sqrt{7}}{\sqrt{7}}=\frac{\sqrt{7}}{7}$$

$$\frac{\sqrt{5}}{\sqrt{12}}\cdot\frac{\sqrt{12}}{\sqrt{12}}=\frac{\sqrt{60}}{12}=\frac{2\sqrt{15}}{12}=\frac{\sqrt{15}}{6}$$

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

You Try

$$\frac{1}{\sqrt{3}}$$

$$\frac{\sqrt{5}}{\sqrt{8}}$$

$$\frac{5}{\sqrt{10x}}$$

What if the radical is greater then 2?

Rationalize the denominator of each expression:
Assume all variables are positive.

$$\frac{1}{\sqrt[3]{6}}$$

$$\sqrt[3]{\frac{5}{18}}$$

$$\frac{6}{\sqrt[4]{4z^3}}$$

You Try

$$\frac{4}{\sqrt[3]{3}}$$

$$\sqrt[3]{\frac{3}{20}}$$

$$\frac{3}{\sqrt[4]{p}}$$

Rationalizing a two term Denominator

Rationalize the denominator:
Assume all variables are positive.

$$\frac{\sqrt{2}}{\sqrt{6}+2} \cdot \frac{(\sqrt{6}-2)}{(\sqrt{6}-2)} = \frac{\sqrt{12}-2\sqrt{2}}{6-2\sqrt{6}+2\sqrt{6}-4}$$

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

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

You Try

$$\frac{4}{\sqrt{3}+1}$$

$$\frac{\sqrt{2}}{\sqrt{6}-\sqrt{2}}$$

Perform the indicated operation

$$\sqrt{\frac{4}{3}}+\frac{4}{\sqrt{48}} = \frac{2}{\sqrt{3}} + \frac{4}{4\sqrt{3}} = \frac{3}{\sqrt{3}}$$

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