

Test Review:

Simplifying Radical Expressions

Mr. Bregu.

$\sqrt{2x}$ Square root!

$$\begin{aligned}\sqrt{4} &= 2 \\ 2 \cdot 2 &= 4 \\ \sqrt{25} &= 5 \\ 5 \cdot 5 &= 25\end{aligned}$$

$$\begin{aligned}\sqrt{x} &= y \\ y \cdot y &= x\end{aligned}$$

What is a radical? (and what does it mean?)

Properties:
Product Property

$$\sqrt{xy} = \sqrt{x} \cdot \sqrt{y}$$

Quotient Property

$$\sqrt{\frac{x}{y}} = \frac{\sqrt{x}}{\sqrt{y}}$$

Using the Properties:

$$\sqrt{45} \overset{\text{simplified}}{=} \sqrt{9 \cdot 5} = \sqrt{9} \cdot \sqrt{5} = 3\sqrt{5}$$

$$\begin{aligned} \sqrt{3} \cdot \sqrt{21} &= \sqrt{3} \cdot \sqrt{3 \cdot 7} = \sqrt{3} \cdot \sqrt{3} \cdot \sqrt{7} = \sqrt{3 \cdot 3} \cdot \sqrt{7} \\ &= \sqrt{9} \cdot \sqrt{7} \\ &= 3\sqrt{7} \end{aligned}$$

$$\begin{aligned} \sqrt{25n^3} &= \sqrt{25} \cdot \sqrt{n^3} = \sqrt{25} \cdot \sqrt{n^2 \cdot n} = \sqrt{25} \cdot \sqrt{n^2} \cdot \sqrt{n} \\ &= 5n\sqrt{n} \end{aligned}$$

$$\sqrt{\frac{5}{49}} = \frac{\sqrt{5}}{\sqrt{49}} = \frac{\sqrt{5}}{7}$$

Rationalize the Denominator:

$$\sqrt{\frac{3}{50}} = \frac{\sqrt{3}}{\sqrt{50}} =$$

Eliminate radicals in the denominator of a fraction...

$$\frac{\sqrt{3}}{\sqrt{25 \cdot 2}} = \frac{\sqrt{3}}{\sqrt{25} \cdot \sqrt{2}} = \frac{\sqrt{3}}{5\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} =$$

$$\frac{\sqrt{3} \cdot \sqrt{2}}{5\sqrt{2} \cdot \sqrt{2}} = \frac{\sqrt{3 \cdot 2}}{5\sqrt{2 \cdot 2}} = \frac{\sqrt{6}}{5 \cdot \sqrt{4}} = \frac{\sqrt{6}}{5 \cdot 2} = \frac{\sqrt{6}}{10}$$

Add and Subtract Radicals:

$$4\sqrt{5} + -7\sqrt{5} =$$

$$(4 + -7)\sqrt{5}$$
$$-3\sqrt{5}$$

$$2\sqrt{3} + 11\sqrt{5}$$

Use commutative and/or distributive properties to rearrange

Simplify

$$10. \sqrt{\frac{16}{81}} = \frac{\sqrt{16}}{\sqrt{81}} = \frac{4}{9}$$

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$$9 \neq \sqrt{9}$$

$$11. \sqrt{\frac{5}{49}}$$

$$12. \sqrt{\frac{x^2}{144}}$$

$$\frac{\sqrt{x^2}}{\sqrt{144}} = \frac{x}{12}$$

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

$$\frac{2}{\sqrt{p}}$$

$$17. \frac{1}{\sqrt{3y}}$$

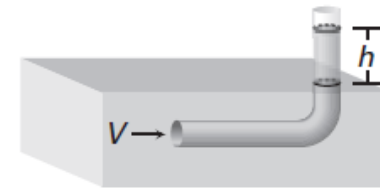
$$18. \frac{9}{\sqrt{2x}}$$

$$\sqrt{5}(8\sqrt{10} + 1)$$

$$\mathbf{23.} \quad (2\sqrt{3} + 5)^2$$

$$\mathbf{24.} \quad (6 + \sqrt{3})(6 - \sqrt{3})$$

Water Flow You can measure the speed of water by using an L-shaped tube. The speed V of the water (in miles per hour) is given by the function $V = \sqrt{\frac{5}{2}h}$ where h is the height of the column of water above the surface (in inches).



- a. If you use the tube in a river and find that h is 6 inches, what is the speed of the water? Round your answer to the nearest hundredth.
- b. If you use the tube in a river and find that h is 8.5 inches, what is the speed of the water? Round your answer to the nearest hundredth.

Homework:

p.723 3-21 (odd), 27-33 (odd),
35-45 (odd), 67