

Algebra 2

Ch. 7 Handout 7.3

Binomial Radical Expressions

Do Now Statements

$$1. \sqrt[3]{\frac{175}{50}}$$

$$2. \sqrt[3]{6c} \cdot \sqrt[3]{8c^{-5}}$$

$$3. \sqrt[3]{\frac{8c}{9d^5}}$$

$$4. \sqrt{\frac{y^2}{x^5}}$$

*****Simplify radicals** before adding or subtracting so you can find all the like radicals.

1. Add or subtract each radical expression if possible.

a) $7\sqrt{xy} + 3\sqrt{xy}$

$$10\sqrt{xy}$$

b) $2\sqrt[3]{x} - 2\sqrt[3]{5}$

radicands are not the same

$$2\sqrt[3]{x} - 2\sqrt[3]{5}$$

1. Add or subtract each radical expression if possible.

c) $2\sqrt{7} - 3\sqrt{7}$

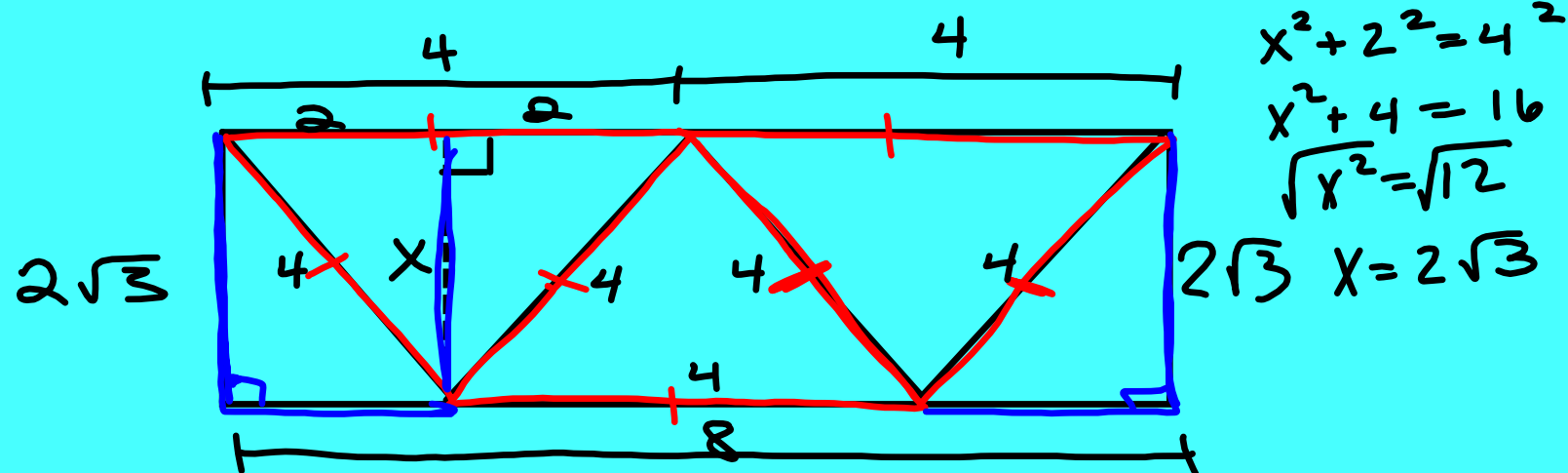
$$\boxed{-\sqrt{7}}$$

Index # not the same

d) $7\sqrt[4]{5} - 2\sqrt[3]{5}$

$$\boxed{7\sqrt[4]{5} - 2\sqrt[3]{5}}$$

2. The rectangular window shown is made up of three equilateral triangles and two right triangles. The equilateral triangles have sides 4 feet in length. Find the perimeter of the window to the nearest tenth of a foot.



exact form: $P = 2\sqrt{3} + 8 + 2\sqrt{3} + 8$

$$P = 4\sqrt{3} + 16$$

$$P \approx 22.9 \text{ ft}$$

3. Simplify.

$$\begin{aligned}
 \text{a) } & 3\sqrt{20} - \sqrt{45} + 4\sqrt{80} \\
 & 3\sqrt{4 \cdot 5} - \sqrt{9 \cdot 5} + 4\sqrt{16 \cdot 5} \\
 & 3 \cdot 2\sqrt{5} - 3\sqrt{5} + 4 \cdot 4\sqrt{5} \\
 & \underline{6\sqrt{5}} - \underline{3\sqrt{5}} + \underline{16\sqrt{5}} \\
 & \boxed{19\sqrt{5}}
 \end{aligned}$$

$$\begin{aligned}
 \text{b) } & \sqrt{50} + 3\sqrt{32} - 5\sqrt{162} \\
 & \sqrt{25 \cdot 2} + 3\sqrt{16 \cdot 2} - 5\sqrt{81 \cdot 2} \\
 & 5\sqrt{2} + 3 \cdot 4\sqrt{2} - 5 \cdot 9\sqrt{2} \\
 & \underline{5\sqrt{2}} + \underline{12\sqrt{2}} - \underline{45\sqrt{2}} \\
 & \boxed{-28\sqrt{2}}
 \end{aligned}$$

$$\begin{aligned}
 \text{c) } & \sqrt[3]{128} - \sqrt[3]{54} \\
 & \sqrt[3]{64 \cdot 2} - \sqrt[3]{27 \cdot 2} \\
 & \underline{4\sqrt[3]{2}} - \underline{3\sqrt[3]{2}} \\
 & \boxed{\sqrt[3]{2}}
 \end{aligned}$$

3. Simplify.

$$d) 2\sqrt{32} - 3\sqrt{243} + 5\sqrt{512}$$

$$2\sqrt{16 \cdot 2} - 3\sqrt{81 \cdot 3} + 5\sqrt{256 \cdot 2}$$

$$2 \cdot 4\sqrt{2} - 3 \cdot 9\sqrt{3} + 5 \cdot 16\sqrt{2}$$

$$\underline{8\sqrt{2}} - 27\sqrt{3} + \underline{80\sqrt{2}}$$

$$\boxed{88\sqrt{2} - 27\sqrt{3}}$$

$$e) 3\sqrt[4]{32} + 4\sqrt[4]{243}$$

$$3\sqrt[4]{16 \cdot 2} + 4\sqrt[4]{81 \cdot 3}$$

$$3 \cdot 2\sqrt[4]{2} + 4 \cdot 3\sqrt[4]{3}$$

$$\boxed{6\sqrt[4]{2} + 12\sqrt[4]{3}}$$

Multiplying radicals expressions that are in the form of binomials by using FOIL.

3. Multiply each binomial radical expression.

a) $(2 + 4\sqrt{3})(1 - 5\sqrt{3})$

b) $(\sqrt{2} - \sqrt{3})^2$

4. Multiplying Conjugates

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

b) $(\sqrt{5} - \sqrt{2})(\sqrt{5} + \sqrt{2})$

5. Rationalize the denominator.

a) $\frac{6 + \sqrt{15}}{4 - \sqrt{15}}$

b) $\frac{8 + \sqrt{6}}{2\sqrt{2} + \sqrt{3}}$

5. Rationalize the denominator.

c)
$$\frac{1 + 2\sqrt{2}}{2 - 3\sqrt{2}}$$

d)
$$\frac{6 + \sqrt[3]{2}}{\sqrt[3]{2}}$$

Assignment:

Day 1: pgs 382-384 1-12, 27-32, 50,
56-58

