

Algebra RH

Essential Question: How do we divide radicals?

Do Now:

a. $\sqrt{\frac{16}{4}}$

b. $\frac{\sqrt{16}}{\sqrt{4}}$

c. $\sqrt{\frac{8}{4}}$

d. $\frac{\sqrt{8}}{\sqrt{4}}$

Dividing Square Root Radicals

To divide two monomial square roots:

- Divide the coefficients to find the coefficient of the quotient.
- Divide the radicands to find the radicand of the quotient.
- If possible, simplify.

A. $\frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}}$

B. $\frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}}$

C. $\frac{x\sqrt{a}}{y\sqrt{b}} = \frac{x}{y} \cdot \sqrt{\frac{a}{b}}$

$$\frac{\sqrt{24}}{\sqrt{2}}$$

$$\sqrt{\frac{4}{9}}$$

$$\frac{6\sqrt{10}}{3\sqrt{2}}$$

Examples:

1. $\frac{\sqrt{72}}{\sqrt{2}}$

2. $7\sqrt{3} \div 3\sqrt{3}$

3. $\frac{3\sqrt{54}}{6\sqrt{3}}$

4. $\sqrt{50} \div \sqrt{2}$

5. $\sqrt{\frac{36}{49}}$

6. $\sqrt{\frac{8}{49}}$

7. $\frac{12\sqrt{20x^5}}{3\sqrt{5x}}$

A fraction is not in simplest form if a radical appears in the denominator.

A. $\frac{4}{\sqrt{3}}$

B. $\frac{3}{2\sqrt{2}}$

Examples:

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

2. $\frac{3}{\sqrt{24}}$

3. $\frac{\sqrt{2}}{2\sqrt{3}}$

4. $\frac{5\sqrt{3a^3}}{4\sqrt{8a}}$

When simplifying fractions where a binomial radical appears in the denominator, multiply the numerator and denominator by the conjugate.

Examples of conjugates:

a) $4 + \sqrt{7}$

b) $\sqrt{3} - 6$

c) $5\sqrt{2} - 1$

Rule: $(p - \sqrt{q})(p + \sqrt{q}) = \underline{\hspace{2cm}}$

Simplify:

1. $\frac{6}{4 - \sqrt{2}}$

2. $\frac{2}{5 + \sqrt{11}}$

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

4. $\frac{\sqrt{5} + 3}{4 - \sqrt{5}}$

RH
Dividing Radicals

HW # _____

Simplify. All final answers must be in simplest radical form.

1. $\sqrt{\frac{75}{3}}$

2. $\sqrt{70} \div \sqrt{10}$

3. $9\sqrt{6} \div 3\sqrt{2}$

4. $\frac{25\sqrt{24}}{5\sqrt{2}}$

5. $\sqrt{\frac{45}{3}}$

6. $\sqrt{36} \div \sqrt{2}$

7. $2\sqrt{25} \div \sqrt{18}$

8. $\frac{3\sqrt{54}}{\sqrt{36}}$

9. $\frac{5}{\sqrt{7}}$

10. $\frac{3}{\sqrt{48}}$

11. $\frac{6}{10+\sqrt{2}}$

12. $\frac{\sqrt{3}}{\sqrt{3}-1}$

13. $\frac{12}{7-\sqrt{3}}$

14. $\frac{4+\sqrt{3}}{\sqrt{2}}$

15. $\frac{2+\sqrt{4}}{8-\sqrt{10}}$

16. $\frac{\sqrt{a}}{a-\sqrt{b}}$

17. Find the area.

