

9.1 Simplifying Radical Expressions Quotient DAY TWO Worksheet

Quotient Property of Square Roots A fraction containing radicals is in simplest form if no radicals are left in the denominator. The **Quotient Property of Square Roots** and **rationalizing the denominator** can be used to simplify radical expressions that involve division. When you rationalize the denominator, you multiply the numerator and denominator by a radical expression that gives a rational number in the denominator.

Quotient Property of Square Roots	For any numbers a and b , where $a \geq 0$ and $b > 0$, $\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$.
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ExampleSimplify $\sqrt{\frac{56}{45}}$.

$$\begin{aligned}\sqrt{\frac{56}{45}} &= \sqrt{\frac{4 \cdot 14}{9 \cdot 5}} \\ &= \frac{2 \cdot \sqrt{14}}{3 \cdot \sqrt{5}} \\ &= \frac{2\sqrt{14}}{3\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} \\ &= \frac{2\sqrt{70}}{15}\end{aligned}$$

Simplify the numerator and denominator.

Multiply by $\frac{\sqrt{5}}{\sqrt{5}}$ to rationalize the denominator.

Product Property of Square Roots

Exercises

Simplify each expression.

1. $\frac{\sqrt{9}}{\sqrt{18}}$

2. $\frac{\sqrt{8}}{\sqrt{24}}$

3. $\frac{\sqrt{100}}{\sqrt{121}}$

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

5. $\frac{8\sqrt{2}}{2\sqrt{8}}$

6. $\sqrt{\frac{2}{5}} \cdot \sqrt{\frac{6}{5}}$

7. $\sqrt{\frac{3}{4}} \cdot \sqrt{\frac{5}{2}}$

8. $\sqrt{\frac{5}{7}} \cdot \sqrt{\frac{2}{5}}$

9. $\sqrt{\frac{3a^2}{10b^6}}$

10. $\sqrt{\frac{x^6}{y^4}}$

11. $\sqrt{\frac{100a^4}{144b^8}}$

12. $\sqrt{\frac{75b^3c^6}{a^2}}$

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

14. $\frac{\sqrt{8}}{2 + \sqrt{3}}$

15. $\frac{\sqrt{5}}{5 + \sqrt{5}}$

16. $\frac{\sqrt{8}}{2\sqrt{7} + 4\sqrt{10}}$

Practice: Show work below or on a separate sheet of paper. Only boxed answers should appear next to the problems provided.

Simplify.

1. $\sqrt{24}$

2. $\sqrt{60}$

3. $\sqrt{108}$

4. $\sqrt{8} \cdot \sqrt{6}$

5. $\sqrt{7} \cdot \sqrt{14}$

6. $3\sqrt{12} \cdot 5\sqrt{6}$

7. $4\sqrt{3} \cdot 3\sqrt{18}$

8. $\sqrt{27tu^3}$

9. $\sqrt{50p^5}$

10. $\sqrt{108x^6y^4z^5}$

11. $\sqrt{56m^2n^4p^5}$

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

13. $\sqrt{\frac{2}{10}}$

14. $\sqrt{\frac{5}{32}}$

15. $\sqrt{\frac{3}{4}} \cdot \sqrt{\frac{4}{5}}$

16. $\sqrt{\frac{1}{7}} \cdot \sqrt{\frac{7}{11}}$

17. $\frac{\sqrt{3k}}{\sqrt{8}}$

18. $\sqrt{\frac{18}{x^3}}$

19. $\sqrt{\frac{4y}{3y^2}}$

20. $\sqrt{\frac{9ab}{4ab^4}}$

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

22. $\frac{8}{3 + \sqrt{3}}$

23. $\frac{5}{\sqrt{7} + \sqrt{3}}$

24. $\frac{3\sqrt{7}}{-1 - \sqrt{27}}$