

Express the following in simplest form, with a rational exponent.

6. $a^5\sqrt{a^4}$

7. $2xy^2\sqrt[3]{x^2y}$

8. $\frac{\sqrt[3]{x^2} \cdot \sqrt{x^5}}{\sqrt[6]{x}}$

9. $\frac{x\sqrt{x^3}}{\sqrt[3]{x^5}}$

Express the following in simplest radical form:

10. $\frac{x^{\frac{1}{5}}}{\frac{1}{x^{\frac{1}{2}}}}$

11. $\left(\frac{1}{x^{-2}}\right)^{-\frac{3}{4}}$

12. $\frac{2x^{\frac{3}{2}}}{(16x^4)^{\frac{1}{4}}}$

13. $\frac{(x^2y^4)^{\frac{1}{3}}}{xy}$

Determine the value of n in each of the following equations:

$$14. \frac{\sqrt[3]{x^8}}{(x^4)^{\frac{1}{3}}} = x^n$$

$$15. \left(\frac{1}{\sqrt[3]{y^2}} \right) y^4 = y^n$$

$$16. \left(\frac{y^{\frac{17}{8}}}{y^{\frac{5}{4}}} \right)^4 = y^n$$

17. Kenzie believes that for $x \geq 0$, the expression $\left(\sqrt[7]{x^2}\right)\left(\sqrt[5]{x^3}\right)$ is equivalent to $\sqrt[35]{x^6}$. Is she correct? Justify your response algebraically.

18. Justify why $\frac{\sqrt[3]{x^2y^5}}{\sqrt[4]{x^3y^4}}$ is equivalent to $x^{\frac{-1}{12}}y^{\frac{2}{3}}$ using properties of rational exponents, where $x \neq 0$ and $y \neq 0$.

19. For n and $p > 0$, is the expression $\left(p^2n^{\frac{1}{2}}\right)^8\sqrt{p^5n^4}$ equivalent to $p^{18}n^6\sqrt{p}$? Justify your answer.