

Rational Exponents & Radicals

Name: _____ Hr: _____

Simplify the expressions and write your answers with POSITIVE rational exponents.

1. $5^{1/2} \cdot 5^{1/4}$

2. $\frac{1}{k^{-1/3}}$

3. $\left(4^{2/3}\right)^6$

4. $\frac{7}{7^{3/4}}$

5. z^0

6. $2x^3y^3z^2 \cdot -5x^{-2}y^4z^2$

7. $9a^{5/7} \cdot a^{1/7}$

8. $\left(3a^{1/2}\right)\left(a^{1/3}b^{2/3}\right)$

9. $\left(5a^{3/2}\right)^2$

10. $\left(16a^{2/3}b^8\right)^{3/4}$

11. $\left(32x^5y^{10}z\right)^{7/5}$

12. $\left(\frac{8x}{y}\right)^{5/3}$

13. $\frac{a^{3/2}b^{3/2}c^{7/6}}{a^5c}$

14. $\frac{6a^{3/4}b^{3/4}}{8a^{-7/4}b^{-1/6}}$

15. $-2a^{-3}$

Write each expression in radical form.

16. $(38y)^{3/4}$

17. $8xy^{1/2}$

Write each expression in exponential form.

18. $\sqrt{4b^3}$

19. $\sqrt[3]{(15p)^2}$

20. $(45y)^{1/3}$

21. $27x^{2/3}$

22. $\sqrt[4]{(6z)^5}$

23. $\sqrt[5]{32p^2}$

24. True or False.

a. $16^{1/4} = 4^{1/2}$	b. $(\sqrt{2})^3 = 2\sqrt{2}$
c. $4^{1/2} = \sqrt{2}$	d. $\sqrt[3]{9} = 3$
e. $5^2 \cdot 5^2 = 25^4$	f. $\sqrt{-25} = -5$
g. $\sqrt[6]{16} = \sqrt[3]{4}$	h. $\frac{9}{4} = \frac{3}{2}$
i. $\sqrt{4} = \sqrt{2}$	j. $\sqrt{283} = 17$
k. $\sqrt[3]{-27} = -3$	l. $\sqrt[4]{-81} = \text{not a real number}$
m. $\sqrt[4]{x^3} \cdot x^{3/2} \cdot \sqrt{x} = x^{11/4}$	n. $\sqrt[3]{y^4} \cdot y^{2/3} = y^2$