

Rational Exponents & Radicals

Name: KEY

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

$5^{3/4}$

$k^{1/3}$

4^4 or 2^8 or 256

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

5. z^0

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

$7^{2/3}$

1

$-10xy^7z^4$

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

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

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

$9a^{6/7}$

$3a^{5/6}b^{2/3}$

$25a^3$

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

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

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

$8a^{1/2}b^6$

$128x^7y^{14}z^{7/5}$

$\frac{32x^{5/3}}{y^{5/3}}$

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

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

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

$a^{11/10}b^{3/2}c^{1/6}$

$\frac{3ab^{11/12}}{4}$

$\frac{-2}{a^3}$

Write each expression in radical form.

Write each expression in exponential form.

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

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

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

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

$\sqrt[4]{(38y)^3}$

$8x\sqrt{y}$

$2b^{3/2}$ or $4^{1/2}b^{3/2}$

$(15p)^{2/3}$

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

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

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

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

$\sqrt[3]{45y}$

$27\sqrt[3]{x^2}$

$(6z)^{5/4}$

$2p^{2/5}$ or $32^{1/5}p^{2/5}$

24. True or False.

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