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. $\frac{1}{k^{-\frac{1}{3}}}$ 3. $\left(4^{\frac{2}{3}}\right)^6$

$5^{\frac{3}{4}}$ $k^{\frac{1}{3}}$ 4^4 or 2^8 or 256

4. $\frac{7}{7^{\frac{1}{3}}}$ 5. z^0 6. $2x^3y^3z^2 \cdot -5x^{-2}y^4z^2$

$7^{\frac{2}{3}}$ 1 $-10xy^7z^4$

7. $9a^{5/7} \cdot a^{1/7}$ 8. $\left(3a^{\frac{1}{2}}\right)\left(a^{\frac{1}{3}}b^{\frac{2}{3}}\right)$ 9. $\left(5a^{\frac{3}{2}}\right)^2$

$9a^{\frac{6}{7}}$ $3a^{\frac{5}{6}}b^{\frac{2}{3}}$ $25a^3$

10. $\left(16a^{2/3}b^8\right)^{3/4}$ 11. $(32x^5y^{10}z)^{\frac{7}{5}}$ 12. $\left(\frac{8x}{y}\right)^{5/3}$

$8a^{\frac{1}{2}}b^6$ $128x^7y^{14}z^{\frac{7}{5}}$ $\frac{32x^{\frac{5}{3}}}{y^{\frac{5}{3}}}$

13. $\frac{a^{\frac{3}{2}}b^{\frac{3}{2}}c^{\frac{7}{6}}}{a^{\frac{2}{5}}c}$ 14. $\frac{6a^{-\frac{3}{4}}b^{\frac{3}{4}}}{8a^{-\frac{7}{4}}b^{-\frac{1}{6}}}$ 15. $-2a^{-3}$

$a^{\frac{11}{10}}b^{\frac{3}{2}}c^{\frac{1}{6}}$ $\frac{3ab^{\frac{11}{12}}}{4}$ $\frac{-2}{a^3}$

Simplify the radicals and write your answers in EXACT form.

16. $\sqrt{27}$ 17. $\sqrt{12}$ 18. $\sqrt{8}$ 19. $\sqrt{44}$

$3\sqrt{3}$ $2\sqrt{3}$ $2\sqrt{2}$ $2\sqrt{11}$

20. $\sqrt{36a^4b}$ 21. $\sqrt[3]{8x^3y^2}$ 22. $\sqrt[5]{a^6b^{12}c^7}$ 23. $\sqrt{\frac{49}{y^2}}$

$6a^2\sqrt{b}$ $2x\sqrt[3]{y^2}$ $ab^2c\sqrt[5]{ab^2c^2}$ $\frac{7}{y}$

24. $\sqrt{\frac{25y^3}{x^4}}$ 25. $\frac{6+\sqrt{45}}{3}$ 26. $\frac{10+\sqrt{50}}{5}$ 27. $\frac{6+\sqrt{12}}{2}$

$\frac{5y\sqrt{y}}{x^2}$ $2+\sqrt{5}$ $2+\sqrt{2}$ $3+\sqrt{3}$

28. $2\sqrt{50ab^5}$ 29. $5\sqrt{98a^{20}b^3}$ 30. $\sqrt[3]{216}$ 31. $\sqrt[4]{81}$

$10b^2\sqrt{2ab}$ $35a^{10}b\sqrt{2b}$ 6 3

32. True or False.

a. $16^{1/4} = 4^{1/2}$	True	b. $(\sqrt{2})^3 = 2\sqrt{2}$	True
c. $4^{\frac{1}{2}} = \sqrt{2}$	False	d. $\sqrt[3]{9} = 3$	False
e. $5^2 \cdot 5^2 = 25^4$	False	f. $\frac{3x}{x+1} = 3$	False
g. $\sqrt[6]{16} = \sqrt[3]{4}$	True	h. $\frac{2+\sqrt{6}}{2} = 1+\sqrt{6}$	False
i. $\sqrt{4} = \sqrt{2}$	False	*j*. $\sqrt{12} = 2\sqrt{6}$	False
k. $\sqrt[3]{-27} = -3$	True	l. $\sqrt{-25} = -5$	False
m. $\frac{\sqrt{15}}{3} = \sqrt{3}$	False	n. $\frac{9}{4} = \frac{3}{2}$	False
o. $\sqrt{283} = 17$	False	p. $\sqrt{18} = 9\sqrt{2}$	False

Write each expression in radical form. **Write each expression in exponential form.**

33. $(38y)^{\frac{3}{4}}$ 34. $8xy^{\frac{1}{2}}$ 35. $\sqrt{4b^3}$ 36. $\sqrt[3]{(15p)^2}$

$\sqrt[4]{(38y)^3}$ $8x\sqrt{y}$ $2b^{\frac{3}{2}}$ or $4^{\frac{1}{2}}b^{\frac{3}{2}}$ $(15p)^{\frac{2}{3}}$

37. $(45y)^{\frac{1}{3}}$ 38. $27x^{\frac{2}{3}}$ 39. $\sqrt[4]{(6z)^5}$ 40. $\sqrt[5]{32p^2}$

$\sqrt[3]{45y}$ $27\sqrt[3]{x^2}$ $(6z)^{\frac{5}{4}}$ $2p^{\frac{2}{5}}$ or $32^{\frac{1}{5}}p^{\frac{2}{5}}$