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

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

4. $\frac{7}{7^{\frac{1}{3}}}$

5. z^{0}

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

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

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

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

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

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. $-2a^{-3}$

Simplify the radicals and write your answers in EXACT form.

16. $\sqrt{27}$

17. $\sqrt{12}$

18. $\sqrt{8}$

19. $\sqrt{44}$

20. $\sqrt{36a^{4}b}$

21. $\sqrt[3]{8x^{3}y^{2}}$

22. $\sqrt[5]{a^{6}b^{12}c^{7}}$

23. $\sqrt{\frac{49}{y^{2}}}$

Simplify the radicals and write your answers in EXACT form.

24. $\sqrt{\frac{25y^3}{x^4}}$

25. $\frac{6+\sqrt{45}}{3}$

26. $\frac{10+\sqrt{50}}{5}$

27. $\frac{6+\sqrt{12}}{2}$

28. $2\sqrt{50ab^5}$

29. $5\sqrt{98a^{20}b^3}$

30. $\sqrt[3]{216}$

31. $\sqrt[4]{81}$

32. **True or False.**

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

Write each expression in radical form.

33. $(38y)^{\frac{3}{4}}$

34. $8xy^{\frac{1}{2}}$

Write each expression in exponential form.

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

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

37. $(45y)^{\frac{1}{3}}$

38. $27x^{\frac{2}{3}}$

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

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