

Rational Exponents

Write each power expression as a radical expression.

1. $x^{\frac{4}{5}}$

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

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

4. $(5x)^{\frac{2}{3}}$

5. $5x^{\frac{2}{3}}$

6. $(-x)^{\frac{5}{4}}$

7. $-x^{\frac{5}{4}}$

8. $x^{-\frac{2}{5}}$

9. $x^{-\frac{1}{3}}$

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

11. $x^{\frac{7}{2}} \cdot x^1$

12. $x^{\frac{1}{2}} \cdot x^{-1}$

13. $(x^{\frac{2}{5}})(x^{\frac{3}{5}})$

14. $2x^{\frac{3}{8}} \cdot 5x^{-\frac{1}{8}}$

15. $64(x^{\frac{1}{2}})^{\frac{1}{3}}$

16. $((64x)^{\frac{1}{3}})^{\frac{1}{2}}$

17. $(64x^{\frac{1}{3}})^{\frac{1}{2}}$

18. $(x^3y)^{\frac{3}{2}}$

19. $\frac{x^{\frac{6}{5}}}{x^{\frac{4}{5}}}$

20. $\frac{x^{\frac{2}{7}}}{x^{\frac{5}{7}}}$

21. $\frac{10x^{-\frac{3}{5}}}{5x^{\frac{1}{5}}}$

22. $\frac{(x^4)^{\frac{1}{3}}}{\frac{9}{x^{\frac{3}{4}}}}$

23. $\left(\frac{x}{y^4}\right)^{\frac{1}{2}}$

24. $\left(\frac{x^2}{y}\right)^{-\frac{3}{2}}$

25. $\frac{y^{\frac{2}{3}}y^{\frac{1}{2}}}{y^{\frac{1}{4}}}$

26. $\frac{x^3y^{\frac{1}{2}}}{y^3(x^2)^{\frac{3}{2}}}$

Write each radical expression as a power expression.

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

35. $(\sqrt[4]{x^3})(\sqrt{x})$

43. $\sqrt{\sqrt{2401}}$

28. $\sqrt[5]{x^4}$

36. $3\sqrt[3]{x} \cdot 3\sqrt[3]{x}$

44. $\sqrt{\sqrt[3]{64}}$

29. $\sqrt{x^5}$

37. $\frac{1}{\sqrt[4]{625}}$

45. $\sqrt{\sqrt{x^5}}$

30. $\frac{1}{\sqrt[4]{x}}$

38. $\sqrt[3]{x^2}$

46. $\sqrt[3]{\sqrt{a^8}}$

31. $\frac{1}{\sqrt[4]{x^5}}$

39. $\sqrt[3]{(-x)^2}$

47. $\sqrt[3]{\sqrt{729y^{12}}}$

32. $\sqrt[3]{27x^7}$

40. $(\sqrt[4]{2y-3})^{-3}$

33. $\sqrt[4]{81x^3}$

41. $(\sqrt[4]{x^4y^3})^{\frac{3}{2}}$

48. $\sqrt[3]{\sqrt[4]{x^{\frac{2}{3}}}}$

34. $\sqrt[3]{-64x}$

42. $-\left(\frac{25\sqrt[3]{x^5}}{5x^{\frac{1}{3}}}\right)^2$

49. Matching: Match each item in column 1 with the equivalent item in column 2. Each item in column 2 may be used once, more than once, or not at all.

Group 1

$$\left(\frac{p}{q}\right)^{\frac{4}{3}}$$

$$\left(\frac{p}{q}\right)^{\frac{3}{4}}$$

$$\left(\frac{q}{p}\right)^{-\frac{4}{3}}$$

$$\left(\frac{p}{q}\right)^{-\frac{3}{4}}$$

$$\left(\frac{q}{p}\right)^{\frac{3}{4}}$$

$$\left(\frac{p}{q}\right)^{-\frac{4}{3}}$$

Group 2

$$\sqrt[4]{\frac{q^3}{p^3}}$$

$$\sqrt[4]{\frac{p^3}{q^3}}$$

$$-\sqrt[4]{\frac{p^3}{q^3}}$$

$$\sqrt[3]{\frac{p^4}{q^4}}$$

$$\sqrt[3]{\frac{q^4}{p^4}}$$

$$-\sqrt[3]{\frac{q^4}{p^4}}$$