

Exponent Review

Simplify. Your answer should contain only positive exponents.

1) $(x^{-3})^3 \cdot (2x)^{-4} \quad x^{-9} \cdot 2^{-4} x^{-4}$

$$\boxed{\frac{1}{16x^{13}}}$$

2) $2a^2b^3 \cdot (b^3)^0$

$$\boxed{2a^2b^3}$$

3) $\frac{(2a^4b^{-4})^{-1}}{b^2} \cdot \frac{2^{-1}a^{-4}b^4}{b^2} = \frac{b^2}{2a^4}$

4) $\left(\frac{x^3y^3}{2y^{-2}}\right)^2 \cdot \frac{x^6y^6}{4y^{-4}} = \frac{x^6y^{10}}{4}$

5) $\frac{x^3y^{-4} \cdot (2xy^2)^0}{x^3} \cdot \frac{x^3y^{-4}}{x^3} = \frac{1}{y^4}$

6) $\frac{2a^3b^3 \cdot (2a^2b^{-2})^{-2}}{a^4b^2} \cdot \frac{2a^3b^3 \cdot 2^{-2}a^{-4}b^4}{a^4b^2}$

$$\frac{2a^{-1}b^7}{4a^4b^2} = \frac{b^5}{2a^5}$$

7) $2x^{\frac{1}{2}} \cdot yx^{\frac{3}{4}} \cdot yx^{\frac{4}{3}} \cdot yx^{\frac{8}{6}}$

$$\boxed{2x^{\frac{11}{6}}y}$$

8) $2v^{-2} \cdot 2u^{\frac{3}{2}} \cdot 2vu^{\frac{4}{2}}$

$$8u^{\frac{7}{2}}v^{-1} = \frac{8u^{\frac{7}{2}}}{v}$$

9) $\left(x^{\frac{1}{3}}y^{\frac{4}{3}}\right)^{\frac{3}{2}}$

$$x^{\frac{3}{6}}y^{\frac{12}{6}}$$

$$\boxed{x^{\frac{1}{2}}y^2}$$

10) $\frac{2u^{-\frac{2}{3}}v^{\frac{4}{3}}}{2u^{-2}v^{\frac{1}{2}}} \cdot \frac{u^{-\frac{2}{3}}v^{\frac{8}{6}}}{u^{-\frac{6}{3}}v^{\frac{3}{6}}} = u^{\frac{4}{3}}v^{\frac{5}{6}}$

11) $\frac{3x^2y^3}{y^2} \quad \boxed{3x^2y}$

12) $\left(a^{-\frac{1}{3}}b^{-\frac{1}{2}} \cdot ab^2\right)^{\frac{4}{3}} \cdot a^{-\frac{4}{9}}b^{-\frac{4}{6}}a^{\frac{4}{3}}b^{\frac{8}{6}}$
 $a^{-\frac{4}{9}}a^{\frac{12}{9}}b^{-\frac{4}{6}}b^{\frac{16}{6}} = a^{\frac{8}{9}}b^{\frac{12}{6}}$
$$\boxed{a^{\frac{8}{9}}b^2}$$

$$13) x^{\frac{1}{3}} y^{\frac{2}{3}} \cdot (yx^{\frac{1}{2}})^{-\frac{4}{3}} \cdot x^{\frac{1}{2}} y^2$$

$$x^{\frac{2}{6}} y^{\frac{4}{6}} \cdot y^{-\frac{4}{3}} x^{-\frac{4}{6}} \cdot x^{\frac{3}{6}} y^{\frac{12}{6}}$$

$$x^{\frac{1}{6}} y^{\frac{16}{6}} y^{-\frac{8}{6}} x^{-\frac{4}{6}} = x^{\frac{1}{6}} y^{\frac{8}{6}}$$

$$= \boxed{x^{\frac{1}{6}} y^{\frac{4}{3}}}$$

$$14) \frac{(x^{\frac{5}{3}} y^3)^{\frac{3}{2}}}{xy^{\frac{3}{2}}} = \frac{x^{\frac{15}{6}} y^{\frac{9}{2}}}{x^{\frac{6}{6}} y^{\frac{3}{2}}} = x^{\frac{9}{6}} y^{\frac{12}{2}}$$

$$= \boxed{x^{\frac{3}{2}} y^2}$$

$$15) \frac{(mn^2)^{\frac{2}{3}}}{m^{\frac{2}{3}}} \cdot \frac{m^{\frac{3}{2}} n^3}{m^{\frac{2}{3}}} = \frac{m^{\frac{4}{6}} n^3}{m^{\frac{4}{6}}}$$

$$= \boxed{m^{\frac{5}{6}} n^3}$$

$$16) \frac{n^{\frac{1}{2}} m^{-2}}{(mn^2)^{-1}} \cdot \frac{n^{\frac{1}{2}} m^{-2}}{m^{-1} n^{-2}} = \frac{n^{\frac{1}{2}} m^{-1}}{m^2 n^{-\frac{4}{2}}} = \boxed{\frac{n^{\frac{5}{2}}}{m}}$$

Write each expression in radical form.

$$17) (5x)^{\frac{5}{2}}$$

$$(\sqrt{5x})^5$$

$$18) k^{\frac{3}{2}}$$

$$(\sqrt{k})^3$$

Write each expression in exponential form.

$$19) (\sqrt[4]{10n})^3$$

$$(10n)^{\frac{3}{4}}$$

$$20) (\sqrt{3m})^5$$

$$(3m)^{\frac{5}{2}}$$

Simplify.

$$21) (64x^3)^{\frac{2}{3}}$$

$$(4x)^2 = \boxed{16x^2}$$

$$22) (4x^2)^{\frac{3}{2}}$$

$$(2x)^3 = \boxed{8x^3}$$

$$23) (25x^2)^{\frac{3}{2}}$$

$$(5x)^3 = \boxed{125x^3}$$

$$24) (n^6)^{\frac{4}{3}}$$

$$(n^2)^4 = \boxed{n^8}$$