

## Simplifying Rational Exponents

**Simplify.**

1)  $(n^4)^{\frac{3}{2}}$

2)  $(27p^6)^{\frac{5}{3}}$

3)  $(25b^6)^{-1.5}$

4)  $(64m^4)^{\frac{3}{2}}$

5)  $(a^8)^{\frac{3}{2}}$

6)  $(9r^4)^{0.5}$

7)  $(81x^{12})^{1.25}$

8)  $(216r^9)^{\frac{1}{3}}$

**Simplify. Your answer should contain only positive exponents with no fractional exponents in the denominator.**

9)  $2m^2 \cdot 4m^{\frac{3}{2}} \cdot 4m^{-2}$

10)  $3b^{\frac{1}{2}} \cdot b^{\frac{4}{3}}$

11)  $\left(p^{\frac{3}{2}}\right)^{-2}$

12)  $\left(a^{\frac{1}{2}}\right)^{\frac{3}{2}}$

$$13) \frac{2x^{-\frac{7}{4}}}{4x^{\frac{4}{3}}}$$

$$14) \frac{4x^2}{2x^{\frac{1}{2}}}$$

$$15) \frac{3x^{-\frac{1}{2}} \cdot 3x^{\frac{1}{2}} y^{-\frac{1}{3}}}{3y^{-\frac{7}{4}}}$$

$$16) \frac{3y^{\frac{1}{4}}}{4x^{-\frac{2}{3}} y^{\frac{3}{2}} \cdot 3y^{\frac{1}{2}}}$$

$$17) \left(m \cdot m^{-2} n^{\frac{5}{3}}\right)^2$$

$$18) \left(a^{-1} b^{\frac{1}{3}} \cdot a^{-\frac{4}{3}} b^2\right)^2$$

$$19) \left(\frac{x^{\frac{1}{2}} y^{-2}}{yx^{-\frac{7}{4}}}\right)^4$$

$$20) \frac{(x^3 y^2)^{\frac{3}{2}}}{\left(x^{-1} y^{-\frac{2}{3}}\right)^{\frac{1}{4}}}$$

$$21) \frac{\left(x^{-\frac{1}{2}} y^2\right)^{-\frac{5}{4}}}{x^2 y^{\frac{1}{2}}}$$

$$22) \frac{\left(x^{-\frac{1}{2}} y^4\right)^{\frac{1}{4}}}{x^{\frac{2}{3}} y^{\frac{3}{2}} \cdot x^{-\frac{3}{2}} y^{\frac{1}{2}}}$$

## Simplifying Rational Exponents

**Simplify.**

$$1) (n^4)^{\frac{3}{2}}$$

$$n^6$$

$$2) (27p^6)^{\frac{5}{3}}$$

$$243p^{10}$$

$$3) (25b^6)^{-1.5}$$

$$\frac{1}{125b^9}$$

$$4) (64m^4)^{\frac{3}{2}}$$

$$512m^6$$

$$5) (a^8)^{\frac{3}{2}}$$

$$a^{12}$$

$$6) (9r^4)^{0.5}$$

$$3r^2$$

$$7) (81x^{12})^{1.25}$$

$$243x^{15}$$

$$8) (216r^9)^{\frac{1}{3}}$$

$$6r^3$$

**Simplify. Your answer should contain only positive exponents with no fractional exponents in the denominator.**

$$9) 2m^2 \cdot 4m^{\frac{3}{2}} \cdot 4m^{-2}$$

$$32m^{\frac{3}{2}}$$

$$10) 3b^{\frac{1}{2}} \cdot b^{\frac{4}{3}}$$

$$3b^{\frac{11}{6}}$$

$$11) \left(p^{\frac{3}{2}}\right)^{-2}$$

$$\frac{1}{p^3}$$

$$12) \left(a^{\frac{1}{2}}\right)^{\frac{3}{2}}$$

$$a^{\frac{3}{4}}$$

$$13) \frac{2x^{-\frac{7}{4}}}{4x^{\frac{3}{4}}}$$

$$\frac{x^{\frac{11}{4}}}{2x^{\frac{3}{4}}}$$

$$14) \frac{4x^2}{2x^{\frac{1}{2}}}$$

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

$$15) \frac{3x^{-\frac{1}{2}} \cdot 3x^{\frac{1}{2}} y^{-\frac{1}{3}}}{3y^{-\frac{7}{4}}}$$

$$3y^{\frac{17}{12}}$$

$$16) \frac{3y^{\frac{1}{4}}}{4x^{-\frac{2}{3}} y^{\frac{3}{2}} \cdot 3y^{\frac{1}{2}}}$$

$$\frac{x^{\frac{2}{3}} y^{\frac{1}{4}}}{4y^2}$$

$$17) \left(m \cdot m^{-2} n^{\frac{5}{3}}\right)^2$$

$$\frac{n^{\frac{10}{3}}}{m^2}$$

$$18) \left(a^{-1} b^{\frac{1}{3}} \cdot a^{-\frac{4}{3}} b^2\right)^2$$

$$\frac{a^{\frac{1}{3}} b^{\frac{14}{3}}}{a^5}$$

$$19) \left(\frac{x^{\frac{1}{2}} y^{-2}}{yx^{-\frac{7}{4}}}\right)^4$$

$$\frac{x^9}{y^{12}}$$

$$20) \frac{(x^3 y^2)^{\frac{3}{2}}}{\left(x^{-1} y^{-\frac{2}{3}}\right)^{\frac{1}{4}}}$$

$$y^{\frac{19}{6}} x^{\frac{19}{4}}$$

$$21) \frac{\left(x^{-\frac{1}{2}} y^2\right)^{-\frac{5}{4}}}{x^2 y^{\frac{1}{2}}}$$

$$\frac{x^{\frac{5}{8}}}{y^3 x^2}$$

$$22) \frac{\left(x^{-\frac{1}{2}} y^4\right)^{\frac{1}{4}}}{x^{\frac{2}{3}} y^{\frac{3}{2}} \cdot x^{-\frac{3}{2}} y^{\frac{1}{2}}}$$

$$\frac{x^{\frac{17}{24}}}{y}$$