

Simplifying Rational Exponents

Date _____ Period _____

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) $\left(a^{\frac{1}{2}}\right)^{\frac{3}{2}}$
 $a^{\frac{3}{4}}$

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

$$\frac{x^{\frac{11}{12}}}{2x^4}$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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