

Math 3  
Rational Exponents 3



Name \_\_\_\_\_

1.  $\sqrt[4]{16x^4y^2}$

$2x\sqrt{y}$

2.  $\sqrt[5]{p^{10}}$

$p^2$

3.  $\sqrt[4]{81x^5y^8z^6}$

$3xy^2z\sqrt[4]{xz^2}$

4.  $\sqrt[3]{\frac{125}{64}} = \frac{5}{4}$

5.  $\sqrt[3]{\frac{64}{27}} = \frac{4}{3}$

6.  $\sqrt[3]{27w^9y^6}$

$3w^3y^2$

7.  $32^{-\frac{2}{5}} = \frac{1}{32^{\frac{2}{5}}}$

$= \frac{1}{2^2} = \frac{1}{4}$

8.  $6\sqrt[3]{16} - 2\sqrt[3]{54}$

$\begin{matrix} \hat{8} \cdot 2 & \hat{27} \cdot 2 \\ 12\sqrt[3]{2} - 6\sqrt[3]{2} \\ 6\sqrt[3]{2} \end{matrix}$

9.  $10\sqrt[3]{54}$

$\begin{matrix} \hat{27} \cdot 2 \\ 30\sqrt[3]{2} \end{matrix}$

10.  $9^{\frac{3}{2}}$

$= 3^3 = 27$

11.  $\frac{1}{x^{-\frac{5}{4}}} = x^{\frac{5}{4}}$

$= x\sqrt[4]{x}$

12.  $-(81)^{\frac{1}{4}} = -\sqrt[4]{81}$

$= -3$

13.  $\left(x^{\frac{1}{5}}\right)^{\frac{5}{2}} = x^{\frac{1}{2}}$

$= \sqrt{x}$

14.  $\sqrt[4]{\sqrt[3]{x^2}} = \left(\left(x^2\right)^{\frac{1}{3}}\right)^{\frac{1}{4}}$

$= x^{\frac{1}{6}} = \sqrt[6]{x}$

15.  $\sqrt[3]{x^2} \cdot \sqrt[4]{x}$

$x^{\frac{2}{3}} \cdot x^{\frac{1}{4}} = x^{\frac{6}{12} + \frac{3}{12}} = x^{\frac{9}{12}} = x^{\frac{3}{4}}$

$\sqrt[12]{x^9}$

16.  $\frac{xy^{\frac{1}{2}}}{x^{\frac{3}{4}}y^{-2}}$

$= \frac{x^{\frac{1}{4}}y^{\frac{1}{2}}}{x^{\frac{3}{4}}y^{-2}} = x^{\frac{1}{4}-\frac{3}{4}}y^{\frac{1}{2}+2} = x^{-\frac{1}{2}}y^{\frac{5}{2}}$

$= \frac{y^2\sqrt[4]{xy^2}}{x^{\frac{1}{2}}}$

17.  $\frac{\sqrt[3]{y^6}}{\sqrt[3]{27y} \cdot \sqrt[3]{y^{11}}} = \sqrt[3]{\frac{y^6}{27y^{12}}}$

$= \sqrt[3]{\frac{1}{27y^6}} = \frac{1}{3y^2}$

18.  $\left(y^{\frac{4}{3}}y^{\frac{1}{3}}\right)^{\frac{4}{3}} = \left(y^{\frac{5}{3}}\right)^{\frac{4}{3}} = y^{\frac{20}{9}}$

$= y\sqrt[3]{y^2}$

19.  $(y^3)^{\frac{1}{6}} = y^{\frac{3}{6}} = y^{\frac{1}{2}}$

$= \sqrt{y}$

20.  $x^{\frac{1}{3}} \cdot x^{\frac{1}{5}} = x^{\frac{5}{15} + \frac{3}{15}} = x^{\frac{8}{15}}$

$= \sqrt[15]{x^8}$