Warm UP

Simplify.

1) $p^2 \cdot 4p$

$4p^3$

2) $(3m^4)^2$

$\frac{9}{3}m^8$

$9m^8$

Simplify. Your answer should contain only positive exponents.

3) $\dfrac{p^3}{p^2}$

$\dfrac{p \cdot pp}{pp}$ p

Simplify.

yyy

4) $\sqrt{196x^2y^3}$

xx

196

98 $\widehat{2}$

49 $\widehat{2}$

77

$14|xy|\sqrt{y}$

1-5 Simplifying Rational Expressions
Multiplication between Bases:

$$a^n a^m = a^{n+m}$$

$$3n^{\frac{2}{3}} \cdot 2n^2 \cdot 3n$$

$$1 \cdot 3 \cdot 2 \cdot 3 n^{\frac{2}{3}} n^{\frac{1 \cdot 3}{3}} \qquad \frac{2}{3} + \frac{2 \cdot 3}{1 \cdot 3}$$

$$18 n^{\frac{2}{3} + \frac{6}{3}}$$

$$18 n^{\frac{8}{3}}$$

$$3x^1 \cdot 2x^{\frac{1}{3}} \cdot 2x^1$$

$$2 \cdot 2 x x x x \qquad \frac{3}{3} + \frac{1}{3} + \frac{3}{3}$$

$$4 x^{\frac{7}{3}}$$

$$2n^{\frac{3}{2} \cdot \frac{5}{3}}$$

$$2n^{\frac{8}{3}}$$

Multiplication between exponents: $(a^m)^n = a^{mn}$

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

$$V^{\frac{1}{2} \cdot \frac{3}{2}}$$

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

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

$$a^{\frac{2}{1} \cdot \frac{3}{2}}$$

$$a^{6/2}$$

$$a^3$$

Dividing expressions with the same base:

$$\frac{3p^2 \cdot \frac{4}{3}}{2p^3} \qquad \frac{3p^{\frac{2}{3}}}{2}$$

$$\frac{3a^{\frac{2}{3}} \cdot \frac{1}{2}}{3a^{\frac{1}{2}}} = \frac{3}{3} \; a^{\frac{1}{6}}$$

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

$$2p^{\frac{1}{3}}p^{\frac{1}{3}}p^{\frac{1}{3}}p^{\frac{1}{3}}$$

$$a^{\frac{1}{6}}$$

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

$$\frac{3}{3 \cdot 2} \frac{1}{} \qquad \frac{x^{\frac{2}{2}} x^{\frac{3}{2}}}{x^{\frac{1}{2}} x^{\frac{1}{2}}}$$

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

$$\boxed{\frac{1 x^{\frac{3}{2}}}{2}}$$

$$\frac{3x^1 \cdot 3x^{\frac{1}{2}} \cdot x^3 \cdot \frac{2}{2}}{2x^{\frac{5}{3}}}$$

$$\frac{3 \cdot 3}{2} \qquad \frac{x^{\frac{2}{2}} x^{\frac{1}{2}} x^{\frac{6}{2}}}{x^{\frac{5}{3}}}$$

$$\frac{9 x^{\frac{9}{2} - \frac{5}{3}}}{2 x^{\frac{5}{3}}}$$

$$\frac{9 x^{\frac{17}{6}}}{2}$$

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

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

$$x^{4/3} - \frac{1}{4}$$

$$\frac{1}{x^{\frac{13}{12}}}$$

$$\left(m^3 n^{\frac{5}{3}}\right)^{\frac{1}{3}} \cdot n^{\frac{5}{3}}$$

$$m^{\frac{3}{3}} n^{\frac{5}{9}} \cdot n^{\frac{5}{3} \cdot \frac{3}{3}}$$

$$\frac{5}{9} + \frac{15}{9}$$

$$m \, n^{\frac{20}{9}}$$