

Warm Up

Simplify:

$$\frac{x^7 y^4 z}{x^3 y^5 z^5}$$

A handwritten expansion of the fraction $\frac{x^7 y^4 z}{x^3 y^5 z^5}$. The numerator is $x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot y \cdot y \cdot y \cdot y \cdot z$ and the denominator is $x \cdot x \cdot x \cdot y \cdot y \cdot y \cdot y \cdot y \cdot z \cdot z \cdot z \cdot z \cdot z$. A horizontal line is drawn between the two rows. Green dots are placed above the first seven x 's in the numerator and above the first three x 's in the denominator. Blue dots are placed above the four y 's in the numerator and above the four y 's in the denominator. Green dots are placed above the z in the numerator and above the five z 's in the denominator. Red lines are drawn through the x 's, y 's, and z that are cancelled out.

$$\frac{x^4}{y z^4}$$

Homework Questions?

Multiple ways to simplify the same problem

$$\frac{25x^7}{5^3} = \frac{\overset{1}{\cancel{5}} \cdot \overset{1}{\cancel{5}} \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x}{\underset{1}{\cancel{5}} \cdot \underset{1}{\cancel{5}} \cdot \underset{1}{\cancel{5}}}$$

$$= \frac{x^7}{5}$$

$$\frac{25x^7}{5^3} = \frac{\overset{1}{\cancel{5}} \cdot \overset{1}{\cancel{5}} \cdot x^7}{\underset{1}{\cancel{5}} \cdot \underset{1}{\cancel{5}} \cdot \underset{1}{\cancel{5}}} = \frac{x^7}{5}$$

$$\frac{25x^7}{5^3} = \frac{\overset{1}{\cancel{5}} \cdot \overset{1}{\cancel{5}} \cdot x^7}{\underset{1}{\cancel{5}} \cdot \underset{1}{\cancel{5}} \cdot \underset{1}{\cancel{5}}} = \frac{x^7}{5}$$

$$\frac{\overset{4}{\cancel{12}} x^2 y^4 z^2}{\underset{3}{\cancel{9}} x^3 y^2 z} = \frac{4 y^2 z}{3 x}$$

$$\frac{9^{12}}{9^8} = 9^{12-8} = 9^4$$

$$\frac{9^{12}}{9^8} \leftarrow \begin{array}{l} \text{4 more} \\ \text{9's in the} \\ \text{numerator} \end{array}$$

$$\frac{m}{m^3} = \frac{\overset{|}{\cancel{m}}}{\underset{|}{\cancel{m}} \cdot \underset{|}{\cancel{m}} \cdot \underset{|}{\cancel{m}}} = \frac{1}{m^2}$$

$$\frac{a^3 b^5}{ab^2} = \frac{\overset{|}{a} \cdot \overset{|}{a} \cdot \overset{|}{a} \cdot \overset{|}{\cancel{b}} \cdot \overset{|}{\cancel{b}} \cdot \overset{|}{\cancel{b}} \cdot \overset{|}{\cancel{b}} \cdot \overset{|}{\cancel{b}}}{\underset{|}{\cancel{a}} \cdot \underset{|}{\cancel{b}} \cdot \underset{|}{\cancel{b}}} = \frac{a^2 b^3}{1} = a^2 b^3$$

$$\frac{\overset{|}{m^7} \overset{|}{\cancel{n^2}}}{\underset{|}{\cancel{m^3}} \overset{|}{\cancel{n^2}}} = \frac{m^7}{m^3} = m^4$$

↑
Form of 1

$$\frac{\overset{1}{\cancel{4}} 12n^5}{\cancel{36}n} = \frac{1 \cdot n^5}{3 \cdot n} = \frac{n^4}{3}$$

$$\frac{\overset{1}{\cancel{2}} 12n^5}{\cancel{36}n} = \frac{12n^5}{6n} = 2n^4$$

$$\frac{\overset{4}{\cancel{32}}x^3y^2z^5}{\cancel{-8}xyz^2} = \frac{-4x^2yz^3}{1} = -4x^2yz^3$$

$$\frac{\cancel{4}}{\cancel{-1}} = \frac{-4}{1}$$

$$\frac{\overset{-3}{\cancel{21}}w^5u^2}{\cancel{7}w^4u^5} = \frac{-3w}{u^3}$$

Dividing Monomials

Simplify each monomial. Final answers must have positive exponents.

1) $\frac{16x^3}{10x}$

2) $\frac{24x^2}{12x^5}$

3) $\frac{16x^4y^2}{4xy^5}$

4) $\frac{15x^4}{25x^2y^5}$

5) $\frac{16x^2y^3}{32x^3y^2}$

6) $\frac{14x^4y^7}{16x^{12}y^2}$

7) $\frac{24x^4y^2}{9y^3}$

8) $\frac{25x^4y^4}{15xy^2}$

9) $\frac{4xy^6z^{12}}{12xy^2z^{16}}$

10) $\frac{64x^3z^7}{40xy^4z}$

11) $\frac{28a}{8a}$

12) $\frac{12p^5}{12p^4}$

13) $\frac{24x^4y^3}{28x^5y^3z}$

14) $\frac{16xyz}{48x^4z^3}$

Homework

Finish classwork