

Reteaching 4-8 Exponents and Division

Simplify $\frac{a^3}{a^3}$ and $\frac{m^2}{m^6}$.

To divide variables with the same non-zero base, you subtract the exponents.

$$\frac{a^3}{a^3} = a^{3-3} \quad \text{Subtract the exponents.}$$

$$= a^0 \quad \text{Simplify the exponent.}$$

However, $\frac{a^3}{a^3} = 1$ as long as a is not zero, just like $\frac{2}{2} = 1$, $\frac{9}{9} = 1$ and so on.

So $\frac{a^3}{a^3} = 1$ and $a^0 = 1$.

$$\frac{m^2}{m^6} = m^{2-6} \quad \text{Subtract the exponents.}$$

$$= m^{-4} \quad \text{Simplify the exponent.}$$

$$\text{However, } \frac{m^2}{m^6} = \frac{\overset{1}{\cancel{m}} \cdot \overset{1}{\cancel{m}} \cdot \overset{1}{m} \cdot \overset{1}{m}}{\underset{1}{\cancel{m}} \cdot \underset{1}{\cancel{m}} \cdot \underset{1}{\cancel{m}} \cdot \underset{1}{\cancel{m}} \cdot m \cdot m} = \frac{1}{m^4}$$

So, $\frac{m^2}{m^6} = \frac{1}{m^4}$ and $m^{-4} = \frac{1}{m^4}$.

The *simplified* forms are 1 and $\frac{1}{m^4}$.

Simplify each expression.

1. $\frac{7^8}{7^2}$ _____

2. $\frac{x^5}{x}$ _____

3. 5^0 _____

4. n^{-3} _____

5. $x^{-2}y^4$ _____

6. $6a^{-3}$ _____

7. $(-4)^0$ _____

8. $\frac{b^3}{b^8}$ _____

9. $\frac{y^2}{y^9}$ _____

10. $7s^{-5}t^{-3}$ _____

11. $\frac{3^{18}}{3^3}$ _____

12. $(-729)^0$ _____

13. $\frac{z^7}{z^{34}}$ _____

14. $4e^3f^{-2}$ _____