

Examples 1–4 Simplify each expression. Assume that no denominator equals zero.

1. $\frac{t^5 u^4}{t^2 u}$

2. $\frac{a^6 b^4 c^{10}}{a^3 b^2 c}$

3. $\frac{m^6 r^5 p^3}{m^5 r^2 p^3}$

4. $\frac{b^4 c^6 f^8}{b^4 c^3 f^5}$

5. $\frac{g^8 h^2 m}{hg^7}$

6. $\frac{r^4 t^7 v^2}{t^7 v^2}$

7. $\frac{x^3 y^2 z^6}{z^5 x^2 y}$

8. $\frac{n^4 q^4 w^6}{q^2 n^3 w}$

9. $\left(\frac{2a^3 b^5}{3}\right)^2$

10. $\frac{r^3 v^{-2}}{t^{-7}}$

11. $\left(\frac{2c^3 d^5}{5g^2}\right)^5$

12. $\left(\frac{3xy^4 z^2}{x^3 yz^4}\right)^0$

13. $\left(\frac{3f^4 gh^4}{32f^3 g^4 h}\right)^0$

14. $\frac{4r^2 v^0 t^5}{2rt^3}$

15. $\frac{f^{-3} g^2}{h^{-4}}$

16. $\frac{-8x^2 y^8 z^{-5}}{12x^4 y^{-7} z^7}$

17. $\frac{2a^2 b^{-7} c^{10}}{6a^{-3} b^2 c^{-3}}$

Example 5 **18. FINANCIAL LITERACY** The gross domestic product (GDP) for the United States in 2008 was \$14.204 trillion, and the GDP per person was \$47,580. Use order of magnitude to approximate the population of the United States in 2008.