

**Simplify. Assume that no denominator is equal to zero.**

1)  $\frac{8^8}{8^4}$

10)  $x^3(y^{-5})(x^{-8})$

19)  $\frac{6f^{-2}g^3h^5}{54f^{-2}g^{-5}h^3}$

2)  $\frac{a^4b^6}{ab^3}$

11)  $p(q^{-2})(r^{-3})$

20)  $\frac{-12t^{-1}u^5v^{-4}}{2t^{-3}uv^5}$

3)  $\frac{xy^2}{xy}$

12)  $12^{-2}$

21)  $\frac{r^4}{(3r)^3}$

4)  $\frac{m^5np}{m^4p}$

13)  $\left(\frac{3}{7}\right)^{-2}$

22)  $\frac{m^{-2}n^{-5}}{(m^4n^3)^{-1}}$

5)  $\frac{5c^2d^3}{-4c^2d}$

14)  $\left(\frac{4}{3}\right)^{-4}$

23)  $\frac{(j^{-1}k^3)^{-4}}{j^3k^3}$

6)  $\frac{8y^7z^6}{4y^6z^5}$

15)  $\frac{22r^3s^2}{11r^2s^{-3}}$

24)  $\frac{(2a^{-2}b)^{-3}}{5a^2b^4}$

7)  $\left(\frac{4f^3g}{3h^6}\right)^3$

16)  $\frac{-15^0u^{-1}}{5u^3}$

25)  $\left(\frac{q^{-1}r^3}{qr^{-2}}\right)^{-5}$

8)  $\left(\frac{6w^5}{7p^6s^3}\right)^2$

17)  $\frac{8c^3d^2f^4}{4c^{-1}d^2f^{-3}}$

26)  $\left(\frac{7c^{-3}d^3}{c^5de^{-4}}\right)^{-1}$

9)  $\frac{-4c^2}{24c^5}$

18)  $\left(\frac{x^{-3}y^5}{4^{-3}}\right)^0$

27)  $\left(\frac{2x^3y^2z}{3x^4yz^{-2}}\right)^{-2}$

28) A lab technician draws a sample of blood. A cubic millimeter of the blood contains  $22^3$  white blood cells and  $22^5$  red blood cells. What is the ratio of white blood cells to red blood cells?

29) The number of three-letter “words” that can be formed with the English alphabet is  $26^3$ . The number of five-letter “words” that can be formed is  $26^5$ . How many times more five-letter “words” can be formed than three-letter “words”?