

Name _____ Section/Period _____
Assigned: _____

Completely simplify each of the following. Assume all variables do not equal zero.

1. $(a^2)^3$

2. a^{-3}

3. $(a^2)(a^5)$

4. $\frac{a^5}{a^6}$

5. $(a^2b^4)^3$

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

7. $\left(\frac{r^4s^{-2}}{r^{-1}s^3}\right)^2$

8. $(2m^2)^3$

9. $\left(\frac{2x^2y^4w^{-3}}{4x^4y^{-2}w^{-3}}\right)^3$

10. $\left(\frac{3^{-1}xyw}{4x^2w^{-2}}\right)^{-2}$

11. $\left(\frac{1.3x^3y^{-2}r^6}{2.6x^{-2}y^4r}\right)^3$

12. $\left(\frac{4^{-2}a^{-2}b^{-4}c^{-1}}{3^{-3}a^{-4}b^{-2}c^{-3}}\right)^{-2}$

13. $\left(\frac{2x^n y^m}{x^m y^n}\right)^r$ (n, m, and r are all greater than zero.)

14. $\left(\frac{(2x^{-3}y^{-2}r^{-1})^0}{(3x^{-1}y^{-2}r^{-3})^2} \right)^3$

Solve each of the following for the variable.

15. $3^r \times 3^r = 3^6$

16. $2^{n+1} \times 2^3 = 2^8$

17. $\frac{n^r}{n^4} = n^2$ Solve for r.

18. $(5^{2n+1})(5^{n+3})(5) = 5^8$

In the following, the same rules of exponents apply, even though some of the exponents are fractions.

Simplify the following.

19. $(2^6 x^2 y^4)^{1/2}$

20. $\left(\frac{16m^4 n^2}{4n^8 m^2}\right)^{2/4}$

21. $(8^2)^{1/2}$