

Study Guide

Dividing by Monomials

Study the following exponent rules.

| | Rule | Example |
|---------------------------|--|---|
| Quotient of Powers | For all integers m and n , and any nonzero number a , $\frac{a^m}{a^n} = a^{m-n}$. | $q^9 \div q^4 = q^{9-4}$ $= q^5$ |
| Zero Exponent | For any nonzero number a , $a^0 = 1$. | $4^0 = 1$ $6^0 = 1$ |
| Negative Exponents | For any nonzero number a and any integer n , $a^{-n} = \frac{1}{a^n}$. | $\frac{r^3}{r^6} = \frac{r \cdot r \cdot r}{r \cdot r \cdot r \cdot r \cdot r \cdot r}$ $= \frac{1}{r^3}$ or $\frac{r^3}{r^6} = r^{3-6} = r^{-3}$ |

Simplify. Assume no denominator is equal to zero.

1. $\frac{a^2}{a}$

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

3. $\frac{15a^3}{45a^2}$

4. $\frac{s^{-3}t^{-5}}{(s^2t^3)^{-1}}$

5. $\frac{a^5b^3}{a^2b^2}$

6. $\frac{k^0}{k^7}$

7. $\frac{(6a^{-1}b)^2}{(b^2)^4}$

8. $\frac{66w^3x^6y^9}{-22wxy^7}$

9. $\left(\frac{4m^2n^2}{8m^{-1}}\right)^0$

10. $\frac{15x^3}{5x^0}$

11. $\frac{x^2}{x^3}$

12. $\frac{(3st)^2u^{-4}}{s^{-1}t^2u^7}$

13. $\frac{b^5}{b^6}$

14. $\frac{x^9}{x^2}$

15. $\frac{24w^7t^4}{6w^3t^2}$

16. $\frac{9x^2z^5}{-3xz^3}$

17. $\frac{(-x^{-1}y)^0}{4w^{-1}y^2}$

18. $\frac{wt^3x}{wx}$

19. $\frac{w^2}{w}$

20. $\frac{(a^2b^3)^2}{(ab)^{-2}}$