

# Properties of Exponents: Day 1

## Unit 1: Extending the Number System

### Focus on Product of Powers and Quotient of Powers

<p>1. <math>m^{-4}n^3 \cdot 2mn</math></p> $2m^{-4+1}n^{3+1}$ $2m^{-3}n^4 = \boxed{\frac{2n^4}{m^3}}$	<p>2. <math>m^{-2} \cdot 4m^{-2}</math></p> $4m^{-2+(-2)}$ $4m^{-4}$ $\boxed{\frac{4}{m^4}}$
<p>3. <math>4ba^4 \cdot 4ab^{-3}</math></p> $16a^{4+1}b^{1-3}$ $16a^5b^{-2}$ $\boxed{\frac{16a^5}{b^2}}$	<p>4. <math>3y^{-3} \cdot 4x^0y^2</math></p> $12x^0y^{-3+2}$ $12y^{-1} = \boxed{\frac{12}{y}}$
<p>5. <math>4xy^0 \cdot y^3 \cdot xy^{-3}</math></p> $4x^{1+1}y^{0+3-3}$ $4x^2y^0$ $\boxed{4x^2}$	<p>6. <math>2x^0y^2 \cdot x^4y^2 \cdot 4x^2y^{-2}</math></p> $8x^{0+4+2}y^{2+2-2}$ $\boxed{8x^6y^2}$
<p>7. <math>\frac{x^{-4}y^2}{2xy}</math></p> $\frac{y^2y^{-1}}{2x^1x^1} = \boxed{\frac{y}{2x^2}}$	<p>8. <math>\frac{4y^3}{yx^{-2}}</math></p> $\frac{4y^3y^{-1}x^2}{1} = 4y^2x^2$ $= \boxed{4x^2y^2}$
<p>9. <math>\frac{2u^0v^{-4}}{2u^{-3}v^0}</math></p> $\frac{2u^0u^3}{2u^{-3}v^4} = \boxed{\frac{u^3}{v^4}}$	<p>10. <math>\frac{2yx^0}{x^4y^{-3}}</math></p> $\frac{2y^1y^3}{x^4} = \boxed{\frac{2y^4}{x^4}}$

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

$$\frac{2x^1 x^{-1}}{y^2} = \frac{2x^0}{y^2} = \boxed{\frac{2}{y^2}}$$

$$12. \frac{3u^{-4}}{3u^4}$$

$$\frac{3}{3u^4 u^4} = \boxed{\frac{1}{u^8}}$$

$$13. (2ba^{-2})^0 \cdot ba^3$$

$$1 \cdot a^3 b = \boxed{a^3 b}$$

$$14. x^2 \cdot (2x^4 y^{-4})^{-3}$$

$$\frac{x^2}{(2x^4 y^{-4})^3} = \frac{x^2}{2^3 x^{4(3)} y^{-4(3)}} = \frac{x^2}{8x^{12} y^{-12}} = \boxed{\frac{y^{12}}{8x^{10}}}$$

$$15. \frac{ab}{3b^2 \cdot 3a^{-2}}$$

$$\frac{a a^2}{3 \cdot 3 b^2 b^{-1}} = \boxed{\frac{a^3}{9b}}$$

$$16. \frac{2x^0 y^3 \cdot 3x^{-3} y^{-3}}{4x^{-2} y^4}$$

$$\frac{2x^0 x^{-3} y^3 y^{-3}}{4x^{-2} y^4} = \frac{3x^{-3} y^0}{2x^{-2} y^4} = \boxed{\frac{3}{2x^1 y^4}}$$

$$17. \frac{(m^2)^3}{2m}$$

$$\frac{m^{2(3)}}{2m} = \frac{m^6 m^{-1}}{2} = \boxed{\frac{m^5}{2}}$$

$$18. \frac{x^{-4} y^3}{(x^4 y^2)^{-3}}$$

$$x^{-4} y^3 (x^4 y^2)^3 = x^{-4} y^3 (x^4 y^2)(x^4 y^2)(x^4 y^2)$$

$$\boxed{x^8 y^9}$$

$$19. \frac{x^2 y^{-2} \cdot 2x^2 y^3}{(2x^2 y^3)^{-2}}$$

$$2x^2 x^2 y^{-2} y^3 (2x^2 y^3)(2x^2 y^3)$$

$$\boxed{8x^8 y^7}$$

$$20. \frac{(x^3 \cdot x^{-2} y^{-4})^0}{2x^{-4} y^{-2}}$$

$$\frac{1}{2x^{-4} y^{-2}} = \boxed{\frac{x^4 y^2}{2}}$$