

Exponent Laws

- $a^m \times a^n = a^{m+n}$ (multiplication law)
- $(a^m)^n = a^{mn}$ (power law)
- $\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$ (power of a quotient law)
- $a^m \div a^n = a^{m-n}$ (division law)
- $(ab)^m = a^m b^m$ (power of a product law)

1. Write in standard form.

- a) $3^2 \times 3^3$
- b) $(-2)^3 \times (-2)^2$
- c) $(5)^4(5)^3$
- d) $(3.2)^2(3.2)^2$
- e) $((y)^2)^3$
- f) $(3)^4 \div (3)^2$
- g) $((-2)^2)^5$
- h) $(-4.5)^3 \div (-4.5)$
- i) $\frac{3^5}{3^3}$
- j) $\frac{(-7)^3}{(-7)^2}$
- k) $-(1.2)^2$
- l) $(-0.6)^2$

2. Multiply.

- a) $(3a)(-2z^3)$
- b) $(-2r^2)(8s)$
- c) $-4c(5de)$
- d) $2xy \times 3xy$
- e) $(-3abm)(2bm)$
- f) $-u(5ut^2)$
- g) $(2a^2b^3c)(-3bc^2d)$
- h) $-5r^2st \times 2rs^2t^2$
- i) $(5x)(4y)(-3z)$
- j) $-2d(3d)(3e)$
- k) $(-k^2mn^2)(4mn)(-2kn^2)$

3. Simplify.

- a) $(3ty)^2$
- b) $(-2xz)^3$
- c) $(-2a^2b)^3$
- d) $(3r^3s)^2$
- e) $(5k^3m^2)^2$
- f) $(-3q^2r^2)^3$

4. Simplify.

- a) $(yz)^2(y^3z)$
- b) $(-2ab)(-ab)^2$
- c) $(5s^2t^2)(-st)$
- d) $(-4k^2m^3)^2(2km)^3$
- e) $(2r^2s^2t)(3rst)^2$
- f) $(4abc)^2(2a^2bc)(ab^3c^3)$
- g) $(m^2n^2p^2)^3(mnp)(-3mn^3p^3)$

5. Simplify.

- a) $2a^4b^3 \div a^2b$
- b) $\frac{6q^3r^2}{3q^2r^2}$
- c) $8x^6y^4 \div (-4x^3y^2)$
- d) $-4w^3x^5 \div (-2w^2x^2)$
- e) $\frac{-9f^3g^5h^2}{6fg^2h}$
- f) $\frac{-12c^5d^5}{18c}$

6. Simplify.

- a) $\frac{6k^2m^4}{3km^2}$
- b) $4a^3b^2c \div 2bc$
- c) $8x^5y^3 \div 2x^3y$
- d) $\frac{-12s^7t^6}{8s^2t^2}$
- e) $-9e^2f^4 \div (-6ef^2)$
- f) $\frac{20d^5e^3f^5}{12d^2e^3f^4}$