

ExponentsRules

Multiplication

$$a^m \times a^n = a^{m+n}$$

Division

$$\frac{a^m}{a^n} = a^{m-n}$$

Power of a Power

$$(a^m)^n = a^{m \times n}$$

Zero

$$a^0 = 1$$

Negative

$$\frac{1}{a^{-m}} = a^m$$

Ex. Simplify

$$a) 2^3 \times 2^4 = 2^7$$

$$b) 2a^3b^1 \times 4a^2b^1 = 8a^5b^2$$

$$c) \frac{3^4}{3^2} = 3^2$$

$$\boxed{x^4} \boxed{y^2} \boxed{1}$$

$$d) \frac{9x^4y^2}{3x^2y} = 3x^2y$$

$$e) \frac{9x^4y^2}{3x^6y^5} = 3x^{-2}y^{-3}$$

$$= \frac{3}{x^2y^3}$$

$$f) (3^4)^2 = 3^8$$

$$g) (2x^2y^3)^4 = 2^4x^8y^{12}$$

$$= 16x^8y^{12}$$

$$h) \left(\frac{(2xy)^3}{(4xy^3)^2} \right)^0 = 1$$

$$i) 3^{-1} = \frac{1}{3}$$

$$j) (-2x^2y)^{-2} = \frac{1}{(-2x^2y)^2}$$

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

Simplify

$$1) \frac{c^2 \times c^3}{c} = \frac{c^5}{c} = c^4$$

$$2) (2c^2c^4)^2$$
$$= 4c^4c^8$$
$$= 4c^{12}$$

$$3) \frac{(2x^1y^2)^2}{4x^2y^6} = \frac{4x^2y^4 \checkmark}{4x^2y^6}$$
$$= 1x^0y^{-2}$$
$$= y^{-2}$$
$$= \frac{1}{y^2}$$

$$1. \frac{(4x^2y^3)^0}{(2x^2y^4)^2}$$

$$= \frac{1}{4x^4y^8}$$

$$2. \left(\frac{2}{5}\right)^{-2}$$

Simplify 1st,
then evaluate
(fraction)

$$\left(\frac{5}{2}\right)^2 \checkmark$$

$$2. \frac{s^5 s^4}{s^{-3}}$$

$$= \frac{s^9}{s^{-3}}$$

$$= s^{12}$$

$$= \frac{25}{4}$$

$$9 - (-3)$$

$$3. \frac{(t^4)^{-5}}{t^6}$$

$$= \frac{t^{-20}}{t^6}$$

$$-20 - 6$$

$$= \frac{t^{-26}}{1}$$

$$= \frac{1}{t^{26}}$$

$$= \frac{1}{t^{26}}$$

$$\begin{aligned} 4. & \frac{(5x)^2(2y)^3}{10xy^2} \\ & = \frac{(25x^2)(8y^3)}{10xy^2} \quad \checkmark \\ & = \frac{200x^2y^3}{10xy^2} \\ & = 20xy \end{aligned}$$

$$\frac{x^3 y^3 z^1}{x y^4 z^{-2}}$$

$$= x^2 y^{-1} z^3$$

$$= \frac{x^2 z^3}{y}$$

$$1 - (-2)$$

Questions from homework?

p. 362

#1-6, 9, 10,
11, 12, 13

$$4. e) \frac{4}{9} \checkmark$$