

# Exponents

## Meaning

$$x^3 = x \cdot x \cdot x$$

$$(x^2y)^3 = x \cdot x \cdot y \cdot x \cdot x \cdot y \cdot x \cdot x \cdot y$$

$$y^{-1} = \frac{1}{y}$$

$$xy^{-2} = \frac{x}{y \cdot y}$$

$$x^0 = 1$$

$$5x^0 = 5 \cdot 1$$

Simplify.  $(x^3y)^2 xy^3$

$xxx y \quad xxx y \quad x yyy$

count the x's  $\Rightarrow 7$

count the y's  $\Rightarrow 5$

$$x^7 y^5$$

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

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

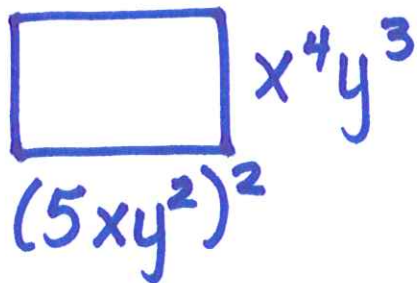
$$= \frac{x^5}{y^2 z^2}$$

Simplify  $(2x^3y)^2(x^{-4}yz)$ .

$$\frac{2xxyy \cdot 2xxxxyyzz}{xxxxx}$$

$$4x^2y^3z$$

Find the area of a rectangle whose width is  $(x^4y^3)$  cm and length is  $(5xy^2)^2$  cm.


$$\begin{array}{l} \square x^4y^3 \\ (5xy^2)^2 \end{array}$$

$$A = Lw \\ = x^4y^3(5xy^2)^2$$

$$= \overset{=}{x \cdot x \cdot x \cdot x \cdot y \cdot y \cdot y} \overset{=}{5 \cdot x \cdot y \cdot y} \overset{=}{5 \cdot x \cdot y \cdot y} \\ = 25x^6y^7 \text{ cm}^2$$

Given a triangle whose area is  $(75x^7y^4)\text{cm}^2$  and width is  $(2xy^3)\text{cm}$ , find its length.

Step 1: Draw a diagram and label.

$$\boxed{75x^7y^4} \quad 2xy^3$$

?

Step 2: Plug into the formula.

$$A = \frac{1}{2}bh$$

$$75x^7y^4 = \frac{1}{2} \cdot b \cdot (2xy^3)$$

$$\frac{75x^7y^4}{xyy} = \frac{b \cdot \cancel{xyy}}{\cancel{xyy}}$$

$$\frac{75 \cancel{x} \cancel{x} \cancel{x} \cancel{x} \cancel{x} \cancel{y} \cancel{y} \cancel{y}}{\cancel{xyy}} = 75x^6y^2$$