

## DIVISION IN ALGEBRA

- 1) REPRESENT THE DIVISION AS A FRACTION.
- 2) WRITE OUT THE FULL EXPRESSION ON THE TOP & BOTTOM.
- 3) CANCEL OUT & WRITE WHAT IS LEFT USING EXPONENTS.

①  $4x^2 \div 2x$

$$\frac{4x^2}{2x} = \frac{\cancel{2} \cdot \cancel{x} \cdot \cancel{x}}{\cancel{1} \cdot \cancel{x}} = 2x^1$$

②  $8x^4 \div 16x^5$

$$\frac{8x^4}{16x^5} = \frac{\cancel{8} \cdot \cancel{x} \cdot \cancel{x} \cdot \cancel{x}}{\cancel{16} \cdot \cancel{x} \cdot \cancel{x} \cdot \cancel{x} \cdot \cancel{x}} = \frac{0.5}{x}$$

$$\textcircled{3} \quad 10x^2 \div 2x^5$$

$$\frac{10x^2}{2x^5} = \frac{\cancel{5}\cancel{10}x\cancel{x}}{\cancel{2}x\cancel{x}x\cancel{x}\cancel{x}} = \frac{5}{x \cdot x \cdot x} = \boxed{\frac{5}{x^3}}$$

$$\textcircled{4} \quad 10x^2y^3 \div 5xy$$

$$\frac{10x^2y^3}{5xy} = \frac{\cancel{2}\cancel{10}x\cancel{x}y\cancel{y}y}{\cancel{5}x\cancel{y}} = \boxed{2x^1y^2}$$

### The NEGATIVE EXPONENT:

$x^{-2}$  → WHEN AN EXPONENT IS NEGATIVE, EVERYTHING STAYS THE SAME, EXCEPT THE VARIABLE FLIPS FROM THE

- TOP → BOTTOM
  - BOTTOM → TOP
- OR

$$\textcircled{1} \quad \frac{2x^{-4}}{1} \Rightarrow \frac{2}{1x^4} \quad (\text{from top} \rightarrow \text{bottom})$$

$$\textcircled{2} \quad \frac{10}{1x^{-3}} \Rightarrow \frac{10x^3}{1} \quad (\text{from bottom} \rightarrow \text{top})$$

DIVIDING BY ( ):

JUST LIKE MULTIPLICATION, IF YOU ARE DIVIDING A ( ) BY SOMETHING, EVERYTHING IN THE ( ) GETS A TURN.

$$\begin{aligned} & (15x^2 - 10x) \div 5x \\ & = \frac{(15x^2 - 10x)}{5x} = \frac{15x^2}{5x} - \frac{10x}{5x} \\ & = \boxed{3x - 2} \end{aligned}$$