

INDICES

THIS IS ANOTHER WORD FOR "POWERS"

eg 2^6
 $2 \times 2 \times 2 \times 2 \times 2 \times 2$

• WHAT DO INDICES MEAN ?

BASE \rightarrow 2 ⁶ ← POWER

THE "BASE" MULTIPLIED BY ITSELF
THE NUMBER OF TIMES INDICATED
BY THE "POWER"

THIS MEANS $\rightarrow 2 \times 2 \times 2 \times 2 \times 2 \times 2$

TWO MULTIPLIED BY ITSELF
6 TIMES.

• THIS IS NOT THE SAME AS THIS

\downarrow

2^6

DO NOT MAKE
THIS MISTAKE

\downarrow

2×6

eg $3^4 = 3 \times 3 \times 3 \times 3$

$5^3 = 5 \times 5 \times 5$

$(-4)^2 = (-4) \times (-4)$

$a^5 = a \times a \times a \times a \times a$

MULTIPLYING POWERS / INDICES

eg $5^3 \times 5^4 = ?$

THIS MEANS \downarrow THIS MEANS \downarrow

$$(5 \times 5 \times 5) \times (5 \times 5 \times 5 \times 5)$$

WHICH MEANS / IS THE SAME AS

$$5 \times 5 \times 5 \times 5 \times 5 \times 5 \times 5 = 5^7$$

SO, $5^3 \times 5^4 = 5^7$

IF BASE IS
THE SAME

MULTIPLYING

① RULE
ADD THE "POWERS"

eg $a^2 \times a^3 = a^5$

DIVIDING POWERS / INDICES

eg $\frac{6^5}{6^3} = \frac{6 \times 6 \times 6 \times 6 \times 6}{6 \times 6 \times 6}$

← NOW WE CAN "CANCEL" THE 6'S ON TOP AND BOTTOM.

$$\frac{\cancel{6} \times \cancel{6} \times \cancel{6} \times 6 \times 6}{\cancel{6} \times \cancel{6} \times \cancel{6}} = 6^2$$

SO $\frac{6^5}{6^3} = 6^2$

② DIVIDING / FRACTION RULE
SUBTRACT THE POWERS.

YOU NEED TO KNOW THESE RULES, AND EQUALLY IMPORTANTLY, YOU NEED TO KNOW WHY THEY WORK.