

## 2.4 Power rules

What does the square or exponent 2 tell us? Re-write this without using the square!

1) Does  $(3 \times 4)^2 = 3^2 \times 4^2$ ? Why or why not?

2) Is this true?  $\left(\frac{2}{5}\right)^5 = \frac{2^5}{5^5}$  Why or why not?

### **Power Rule**

For any real number  $a$  and any integers  $m, n$ :

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

Example: Simplify

1)  $(2^3)^4$

2)  $(3^2)^5$

**Power to a power rule**

For any integer  $n$ , and any real number  $a$  and  $b$ :

$$(ab)^n = a^n b^n$$

Example 2:

1)  $(2 \times 3)^4$

3)  $(a^2 b^3)^2$

$$4) \left(\frac{2}{3}\right)^2$$

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