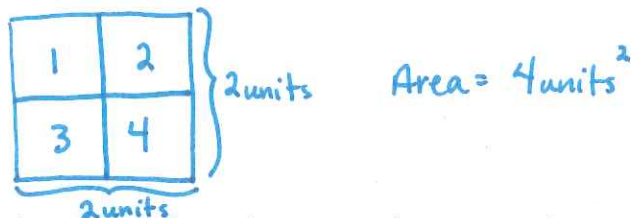


Relating Squares and Square Roots to a Square Shape

- Area is the term used to define the amount of space taken up by a 2D shape. It is measured in square units (Ex. mm^2 , cm^2 , m^2 , km^2 , etc.)



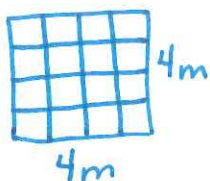
- Recall that the formula to calculate the area of a square is:

$$A = l \times w \quad \text{where: } A - \text{area in units squared}$$

l - length

w - width

Ex.



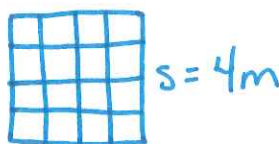
$$\begin{aligned} A &= l \times w \\ &= 4m \times 4m \\ &= 16m^2 \end{aligned}$$

- Because the length is equal to the width in a square (all sides are the same), we could also use the formula:

$$A = s^2 \quad \text{where: } A - \text{area in units squared}$$

s - side length

Ex.



$$\begin{aligned} A &= s^2 \\ &= 4m^2 \\ &= 16m^2 \end{aligned}$$

- The square of a number can be thought of as the area of a square

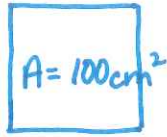
Ex.



$(6cm)^2 = 36cm^2$, Therefore a square with a sidelength of 6cm has an area of $36cm^2$.

- The square root of a number can be thought of as the side length of a square.

Ex.



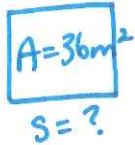
$\sqrt{100\text{cm}^2} = 10\text{cm}$, Therefore the sidelength of this square is 10cm.

- If you know one of these values, you can use it to find the other one:

$$A = s^2 \text{ where: } A\text{-area} \\ s\text{-sidelength} \quad \underline{\text{OR}}$$

$$s = \sqrt{A} \text{ where: } A\text{-area} \\ s\text{-sidelength}$$

Ex 1)

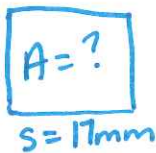


If given the area, take the square root of it to determine the sidelength.

$$s = \sqrt{A} \\ = \sqrt{36\text{m}^2} \\ = 6\text{m}$$

The sidelength is 6m.

Ex 2)



If given the sidelength, square it to find the area.

$$A = s^2 \\ = (17\text{mm})^2 \\ = 289\text{mm}^2$$

The area of this square is 289mm².

- Remember your **area units** will always be **squared** or to the power of 2 (i.e. mm², cm², m², km²)
- Your side length is only measuring 1 dimension, so they will not have an exponent associated with them (i.e. mm, cm, m, km)