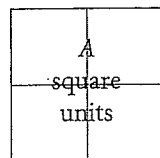


$$8 \text{ units} = \sqrt{64} \text{ units}$$

► This is true for all squares.



$$l = \sqrt{A} \text{ units}$$

$$l = \sqrt{A} \text{ units}$$

► In the square:

- the side length is 8 units and the area is 8^2 square units
- the area is 64 square units and the side length is $\sqrt{64}$ units

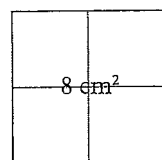
► In the square:

- the side length is l units and the area is l^2 square units
- the area is A square units and the side length is \sqrt{A} units

► Squares can have areas that are not square numbers.

The side length of this square is $\sqrt{8}$ cm and the area is $(\sqrt{8})^2 = 8 \text{ cm}^2$

The area is 8 cm^2 and the side length is $\sqrt{8}$ cm.

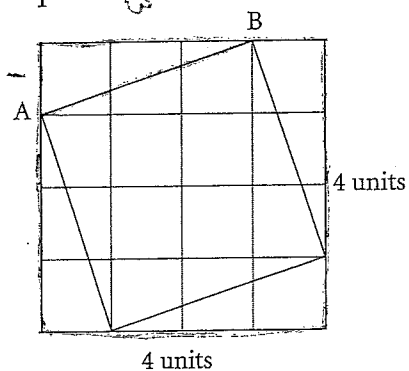


$$l = \sqrt{8} \text{ cm}$$

► You can find the length of a line segment AB on a grid by constructing a square on the segment. The length AB is the square root of the area of the square.

Draw an enclosing square around the square containing AB.

Then find the area of the enclosing square, and subtract the sum of the areas of the triangles.



The area of the enclosing square is 4^2 square units = 16 square units

Each triangle has area $\frac{1}{2} \times 1 \text{ unit} \times 3 \text{ units} = 1.5$ square units

4 triangles have area 4×1.5 square units = 6 square units

The area of the square with AB as a side is

16 square units - 6 square units = 10 square units

So, the length of AB is $\sqrt{10}$ units.

Tip

The square of the square root of a number is that number. For example, $(\sqrt{2})^2 = 2$. $\sqrt{8}$ is not a whole number. It is called an irrational number.

HINT

Use the formulas $A = s^2$ for the area of a square and $A = \frac{1}{2}bh$ for the area of a triangle.




1.3 Measuring Line Segments

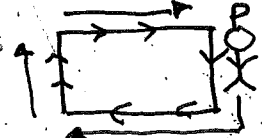
Name _____

Blk 2-3

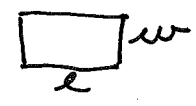
Area: The amount of space covered

 by a region
: units are squared $\text{cm}^2, \text{m}^2, \text{mm}^2$

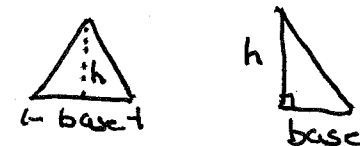
Perimeter: The distance around something

 : for a circle it's called circumference

Calculating Area

square or rectangle $A_{\square} = l \cdot w$ 

Triangle $A_{\triangle} = \frac{1}{2} \cdot b \cdot h$



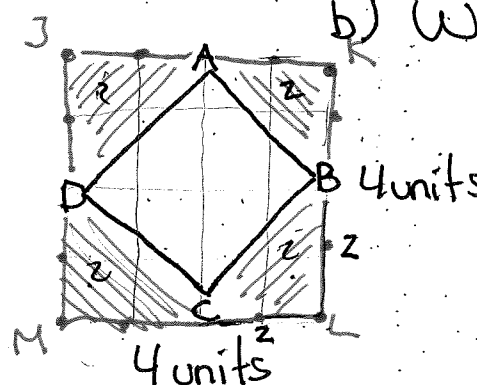
Circle $A_{\circ} = \pi \cdot r^2$



Calculating Area and Side Length

Ex 1 a) Find the area of square ABCD

b) What is the side length AB?



a) - draw an enclosing square JKLM

$$- A_{\square JKLM} = 4 \cdot 4 = 16 \text{ unit}^2$$

- the \triangle formed by the enclosing square are congruent (same size)

$$- A_{\triangle} = \frac{1}{2} b \cdot h = \frac{1}{2} \cdot 2 \cdot 2 = 2 \text{ units}^2$$

$$- \text{Area of all 4 } \triangle \text{'s} = 2 + 2 + 2 + 2 = 8 \text{ units}^2$$

$$\text{Area}_{\square ABCD} = \text{Area}_{\square JKLM} - \text{Area 4 } \triangle \text{'s}$$

$$\text{Area}_{\square ABCD} = 16 - 8 = 8 \text{ units}^2$$

to be continued... part B

1.3 HW: 3, 4, 5, (6) later ★ Mark Your HW ★

* Simplify/Find/Calculate/Solve : All mean "do the ^^
math" ^