

MINISTRY OF EDUCATION
SECONDARY ENGAGEMENT PROGRAMME
CHRISTMAS TERM 2020/2021

GRADE 9

SUBJECT: MATHEMATICS

WEEK 7

Lesson #1

Topic: Measurement

Sub-Topic: Area of Shapes

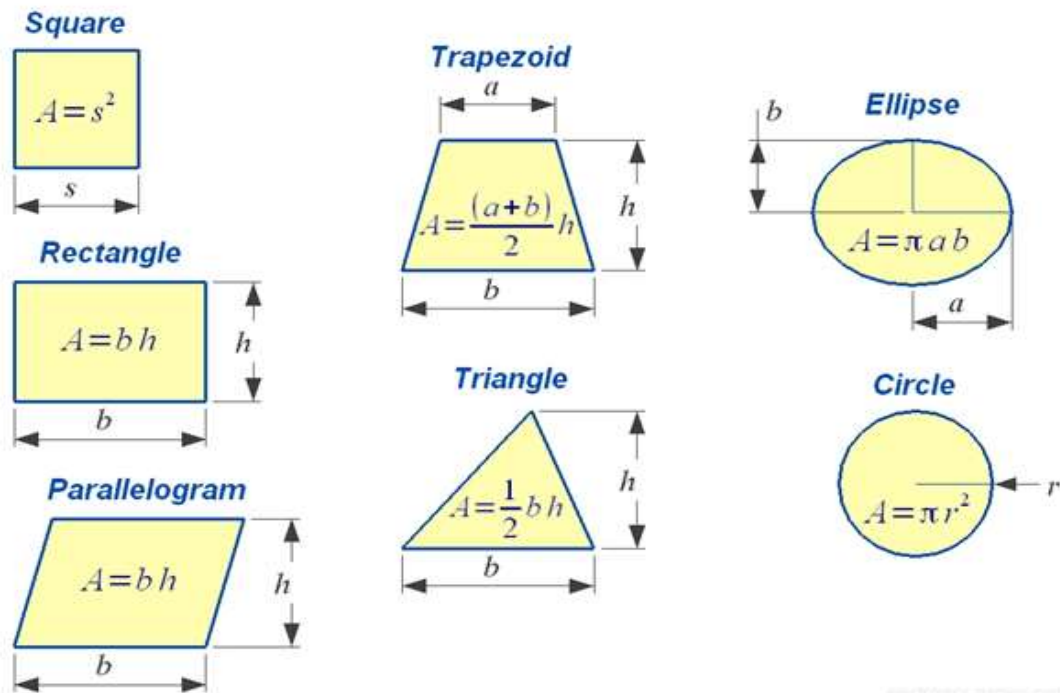
Objective:

Students will:

- ✓ Calculate the area of the four basic shapes;

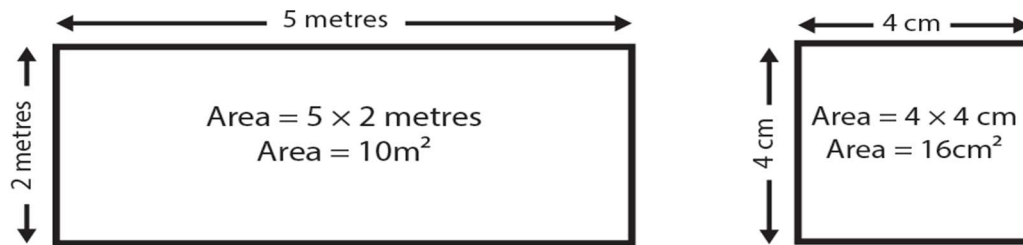
Content:

Finding Area







Examples of finding Area of plane figures

Area of square and rectangle:



Area of circle:

The area of a circle
Use $\pi = 3.14$ to find the area of the following circles:

 2 cm	$A = \pi r^2$ $= 3.14 \times 2^2$ $= 12.56 \text{ cm}^2$	 10 m	$A = \pi r^2$ $= 3.14 \times 5^2$ $= 78.5 \text{ m}^2$
 23 mm	$A = \pi r^2$ $= 3.14 \times 23^2$ $= 1661.06 \text{ mm}^2$	 78 cm	$A = \pi r^2$ $= 3.14 \times 39^2$ $= 4775.94 \text{ cm}^2$

Area of triangle:

The diagram shows three triangles. The first is a right-angled triangle with a base of 9 cm and a height of 8 cm. The area is calculated as $\frac{9 \times 8}{2} = \frac{72}{2} = 36 \text{ cm}^2$. The second is a general triangle with a base of 20 cm and a height of 7 cm. The area is calculated as $\frac{20 \times 7}{2} = \frac{140}{2} = 70 \text{ cm}^2$. The third is a right-angled triangle with a base of 6 cm and a height of 4 cm. The area is calculated as $\frac{6 \times 4}{2} = \frac{24}{2} = 12 \text{ cm}^2$.

Heron's formula states that the area of a triangle whose sides have lengths a , b , and c is

$$A = \sqrt{s(s-a)(s-b)(s-c)},$$

where s is the semiperimeter of the triangle; that is,

$$s = \frac{a+b+c}{2}$$

Heron's formula can also be written as

$$A = \frac{1}{4} \sqrt{(a+b+c)(-a+b+c)(a-b+c)(a+b-c)}$$

$$A = \frac{1}{4} \sqrt{2(a^2b^2 + a^2c^2 + b^2c^2) - (a^4 + b^4 + c^4)}$$

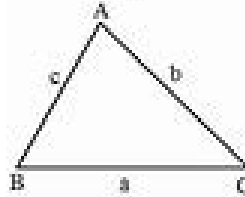
$$A = \frac{1}{4} \sqrt{(a^2 + b^2 + c^2)^2 - 2(a^4 + b^4 + c^4)}$$

$$A = \frac{1}{4} \sqrt{4a^2b^2 - (a^2 + b^2 - c^2)^2}$$

$$\text{Area of } \Delta = \sqrt{s(s-a)(s-b)(s-c)}$$

Where s is semi perimeter of Δ .

$$s = \frac{1}{2} (\text{sum of all sides}) = \frac{1}{2} (a+b+c)$$



and a, b, c are sides of Δ .

Note:

Use $\frac{1}{2}$ (base) (height) for area of right angle triangle,

if any two sides are given.

Area of Parallelogram and Rhombus

Area of Parallelogram

The area of a Parallelogram equals the base times the height.

$$A = b \times h$$



$$A = b \times h$$

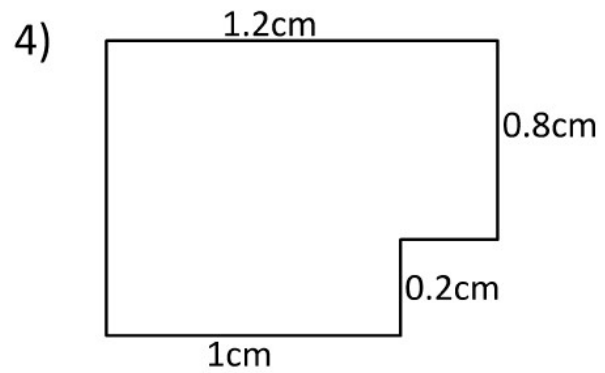
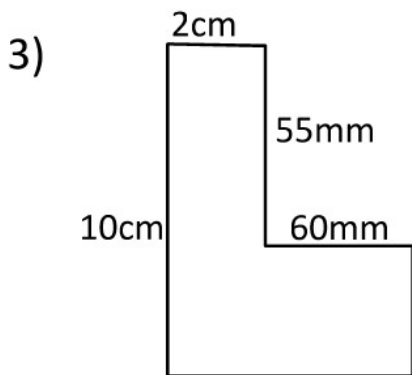
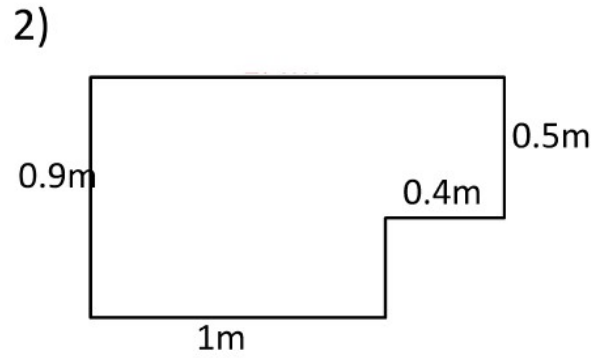
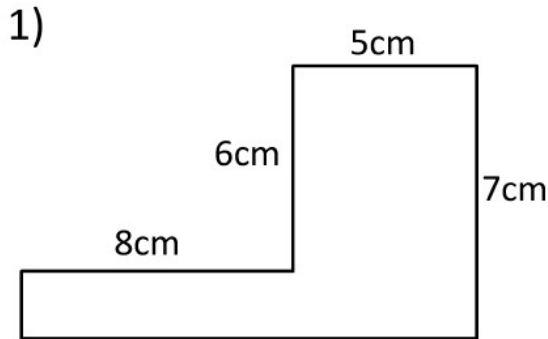
$$A = 8 \times 7$$

$$A = 56 \text{ cm}^2$$

Review

Exercise: Lesson 7 .1

Determine the area of each of the following shapes.
Show all working.



Solution:

1. 43cm^2
2. 1.38m^2
3. 47cm^2
4. 1.16cm^2

Reference:

byjus.com/maths/area-of-a-triangle/