# Measurement

## Learning Objectives

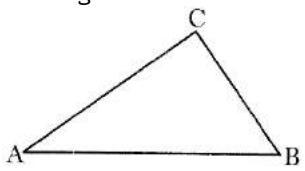
- Perimeter
- Area
- Volume

## Perimeter

Perimeter is referred as the length of the boundary line, which surrounds the area occupied by a geometrical shape. Perimeters of different geometrical shapes are explained below.

### A. Perimeter of a Triangle

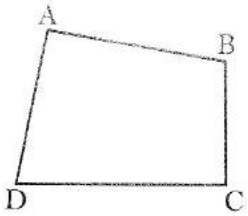
A triangles has three sides. Perimeter of a triangle is the sum of its all the three sides.




Perimeter of the triangle $ABC = AB + BC + CA$

### B. Perimeter of a Quadrilateral

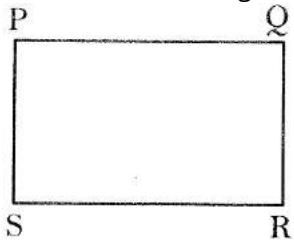
Perimeter of a quadrilateral is the sum of the length of its four sides.



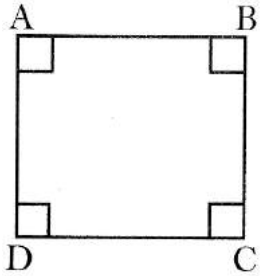

In quadrilateral ABCD, perimeter $= AB + BC + CD + DA$

### C. Perimeter of a Rectangle

Perimeter of a rectangle = 2 (Length + Breadth).




### D. Perimeter of a square $= 4 \times$ side.

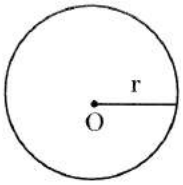



Perimeter of the square $ABCD = 4 \times AB$

### E. Perimeter of a Circle

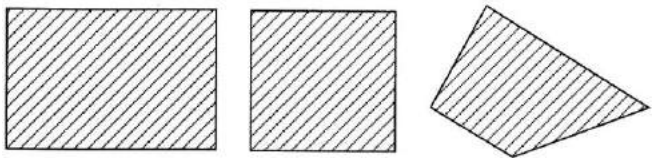
Perimeter of a circle = $2\pi r$

Where $\pi = \frac{22}{7} = 3.14$ and r = radius of the circle




# Area

All the geometrical shapes occupies some space. The occupied space by a geometrical shape is called area of that geometrical shape.



Shaded part in the above figures represent area.

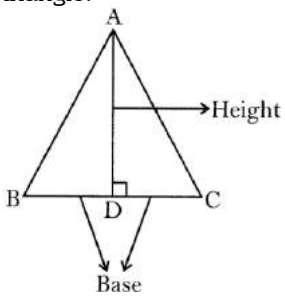
Unit of area is $cm^2$ or $m^2$.

**Areas of different geometrical shapes are listed below**

### A. Area of a Triangle

Area of a triangle $= 1/2 \times base \times height$.

Where base is the one side of a triangle and height is the length of the line segment drawn $90°$ on the base of that triangle.



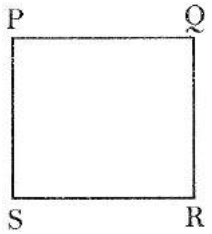

### B. Area of a Rectangle

Area of a rectangle =length $\times$breadth.


Area of the rectangle $PQRS = PQ \times QR$. Where PQ is the length and QR is the breath.

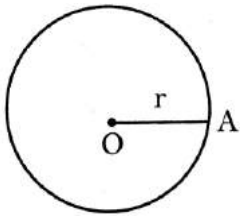
### C. Area of a Square

Area of a square =side$^2$=side $\times$side




Area of the square $PQRS = PQ \times PQ = PQ^2$.

**D. Area of a Circle**

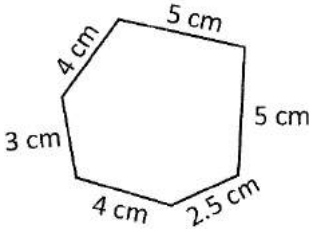



Area of the circle = $\pi r^2$

Where $\pi = \frac{22}{7} = 3.14$

# Commonly Asked Questions

**1. Find the perimeter of the following figure.**



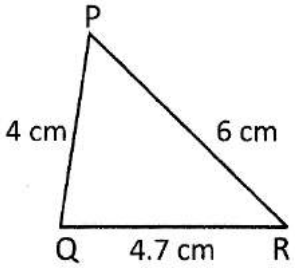

(a) 22.45 cm (b) 23.50 cm
(c) 20.15 cm (d) 15.55 cm
(e) None of these

**Answer: (b)**

**Solution:** Perimeter of the figure $= 4\ cm + 3\ cm + 4\ cm + 2.5\ cm + 5\ cm + 5\ cm = 23.50\ cm$.

**2. Find the perimeter of the following triangle.**

(a) 14.7cm (b) 13.2 cm
(c) 13.2c m (d) 16.5 cm
(e) None of these

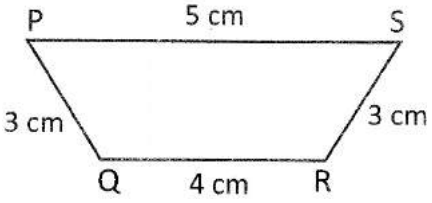



**Answer: (a)**

**Solution:** Perimeter of the triangle PQR
$= 4\ cm + 4.7\ cm + 6\ cm$
$= 14.7\ cm$

**3. Find the perimeter of the following quadrilateral.**

(a) 12 cm (b) 10 cm
(c) 15 cm (d) 19 cm
(e) None of these




**Answer: (c)**

**Solution:** Perimeter of the quadrilateral $= PS + SR + RQ + QP = 5\ cm + 3\ cm + 4\ cm + 3cm = 15\ cm$

**4. Find the perimeter of the rectangle whose length is 12 cm and breadth is 8 cm.**

(a) 40 cm (b) 20 cm
(c) 15 cm (d) 30 cm
(e) None of these
**Answer: (a)**
**Solution:** Perimeter of the rectangle
$= 2(12 + 8) = 40\ cm.$

**5. Find the perimeter of the square whose length of one side is 9 cm.**

(a) 32 cm (b) 31 cm
(c) 36 cm (d) 15 cm
(e) None of these
**Answer: (c)**
**Solution:** Perimeter of a square $= 4 \times side$
$= 4 \times 9\ cm = 36\ cm$

**6. If radius of a circle is 0.35 cm, find the perimeter of the circle.**

(a) 2.2 cm (b) 2.1 cm
(c) 2.3 cm (d) 3.1 cm
(e) None of these
**Answer: (a)**
**Solution:** Perimeter the circle $= 2\pi r$
$= 2 \times \frac{22}{7} \times 0.35$ cm
$= 2.2\ cm$

**7. Find the area of the triangle whose base is 75 cm and height is 80 cm.**

(a) $3000\,cm^2$ (b) $1500\,cm^2$
(c) $3500\,cm^2$ (d) $2000\,cm^2$
(e) None of these
**Answer: (a)**
**Solution:** Area of the triangle $= 1/2 \times b \times h$
$= \frac{1}{2} \times 75\ cm \times 80\ cm = 3000\ cm^2$

**8. Find the area of the rectangle whose length is 17 cm and breadth is 15 cm.**

(a) $253\,cm^2$ (b) $255\,cm^2$
(c) $241\ cm^2$ (d) $234\ cm^2$
(e) None of these
**Answer: (b)**
**Solution:** Area of the rectangle $= l \times b$
$= 17\ cm \times 15\ cm = 255\ cm^2$

**9. Find the area of the square whose length of each side is 21 cm.**

(a) $441\,cm^2$ (b) $420\,cm^2$
(c) $244\,cm^2$ (d) $211\,cm^2$
(e) None of these
**Answer: (a)**
**Solution:** Area of the square $= side \times side = 21$ cm $\times 21$ cm $= 441$ cm$^2$

**10. Find the area of the circle whose radius is 0.28 cm.**

(a) $0.2342 cm^2$ (b) $0.2251 cm^2$

(c) $0.2464 cm^2$ (d) $0.2142 cm^2$

(e) None of these

**Answer: (c)**

**Solution:** Area of a circle $= 2r^2$

$= \frac{22}{7} \times 0.28\ cm \times 0.28\ cm = 0.2464\ cm^2$

**11. Find the volume of the cuboid whose length, breadth and height are 15 cm, 13 cm and 14 cm respectively.**

(a) $2507 cm^2$ (b) $2730\ cm^2$

(c) $2302 cm^2$ (d) $2350\ cm^2$

(e) None of these

**Answer: (b)**

**Solution:** Volume of the cuboid $= l \times b \times h$

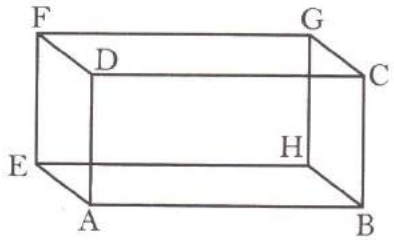
$= 15\ cm \times 13\ cm \times 14\ cm = 2730\ cm^3$

# Volume

In our daily life a number of things are stored in different kinds of containers Holding capacity of a container is called its volume.

**Volume of a Cuboid**

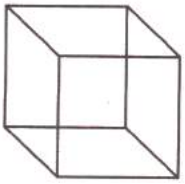
Volume of a cuboid = length × breadth × height = lbh.




Volume of the cuboid $ABCDEFG = AB \times AE \times BC$.

Where, length = AB, breadth = AE and height = BC

**Volume of a Cube**



Volume of a cube $= side^3 = side \times side \times side$