



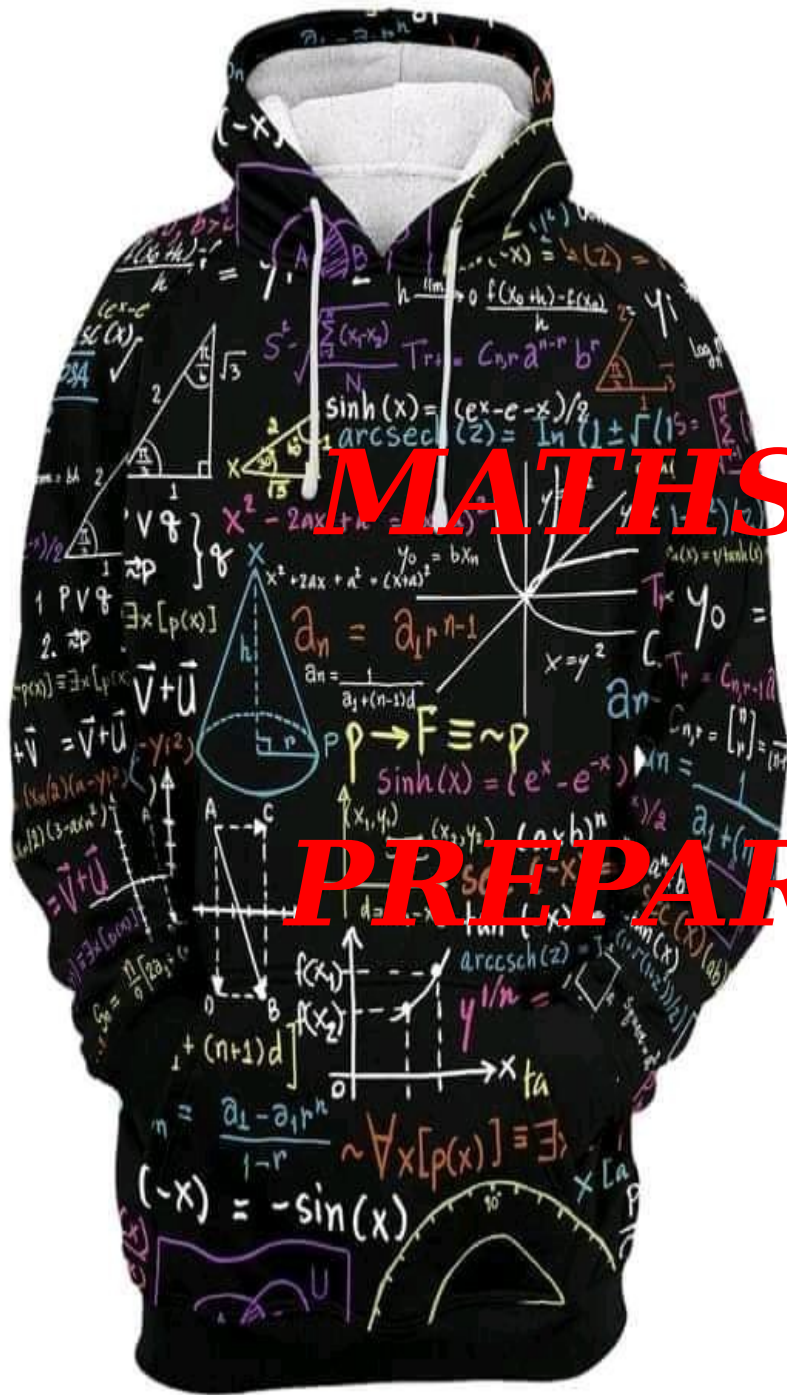
NUR AFRICA ACADEMY

MATHS REVISION NOTE FOR

GRADE - 7

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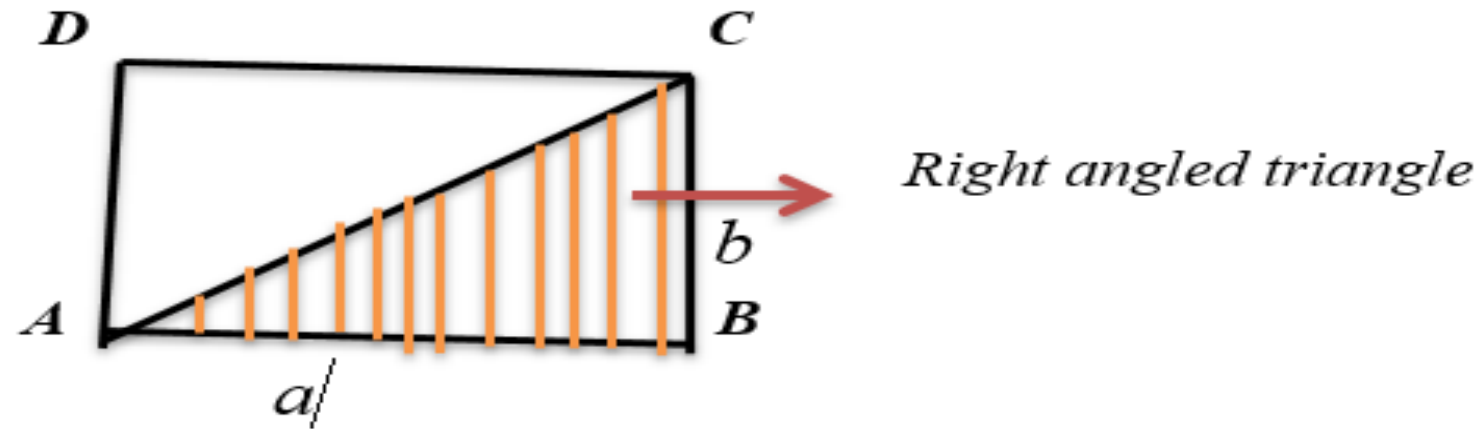


5.3 Measurement

5.3.1 Area of a Triangle

The area of right angled triangle

- *The diagonal of a rectangle divides in two congruent triangles.*



The two sides of the triangle ABC

- $\overline{AB}$ (a) is the base of the triangle
 - $\overline{BC}$ (b) is the height (altitude) of the triangle.
- Area of the rectangle is given by:*

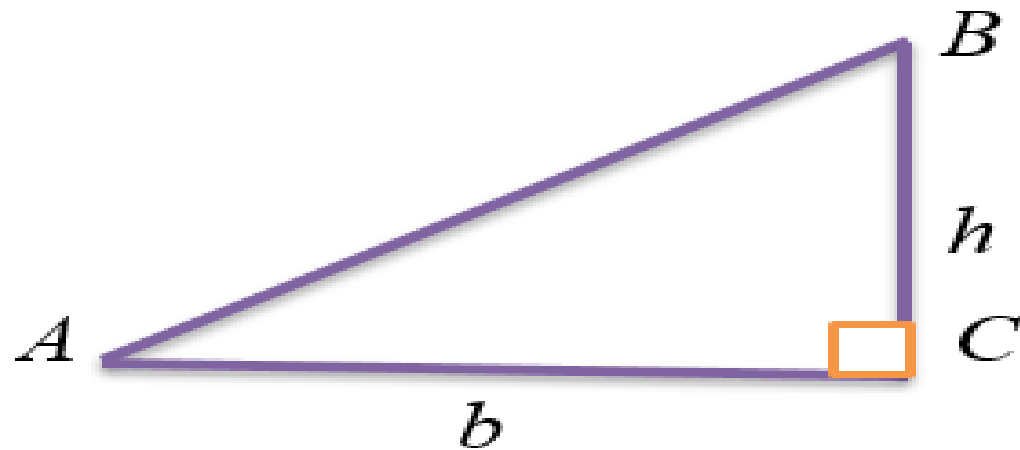
$$A = \underline{a \times b}$$

But, Area of a right angled triangle is half of the rectangle. So the area of the right angled triangle is given by

$$A = \frac{a \times b}{2}$$

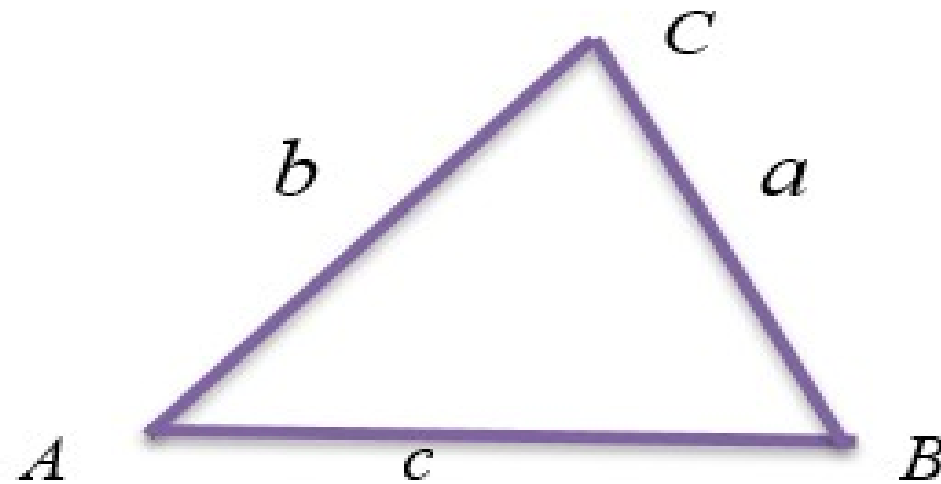
Theorem: *The area of the right angled triangle ABC with base b and height h is given by:*

$$A = \frac{bh}{2} = \frac{1}{2} bh$$



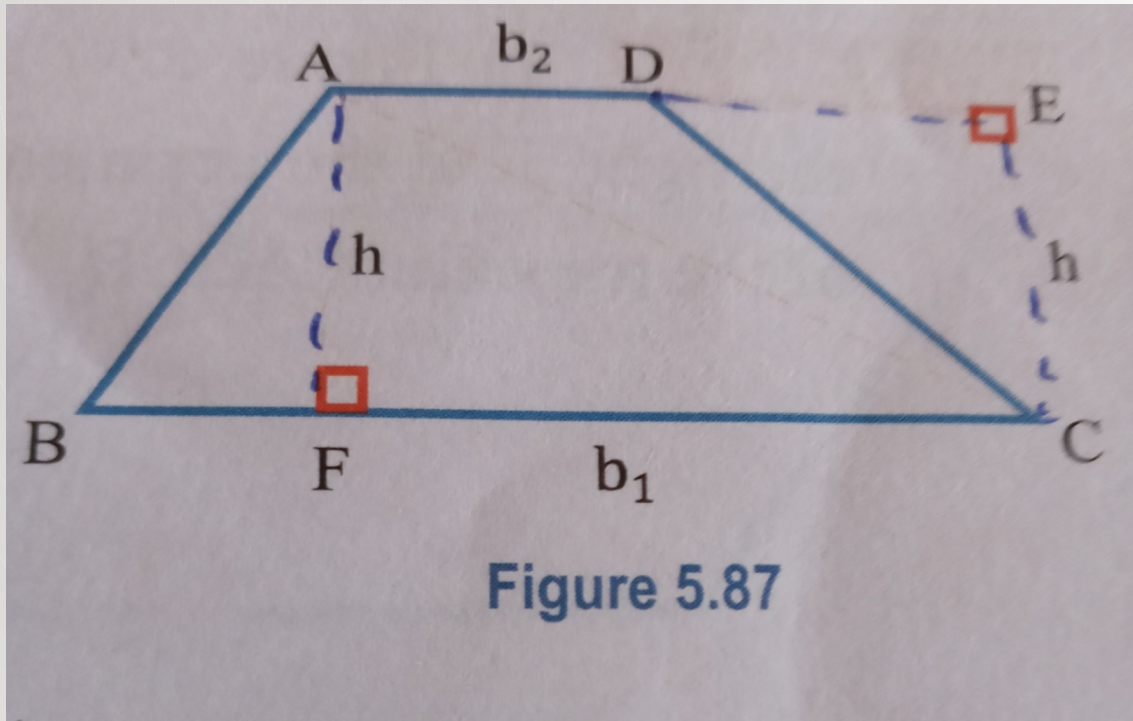
Perimeter of Triangles

- *The perimeter of a triangle is the sum of the three sides of the triangle.*



$$P = a + b + c$$

- **5.3.2 Perimeter & Area of Trapezium**



- $$\begin{aligned} \text{Thus } a(ABCD) &= a(\triangle ABC) + a(\triangle ACD) \\ &= \frac{1}{2}(BC \times AF) + \frac{1}{2}(AD \times CE) \\ &= \frac{1}{2}(\underline{b1 \ h}) + \frac{1}{2}(\underline{b2 \ h}) \\ AF &= CE = h \\ &= \frac{h}{2}(b1 + b2) \end{aligned}$$

Therefore, the area of the trapezium is

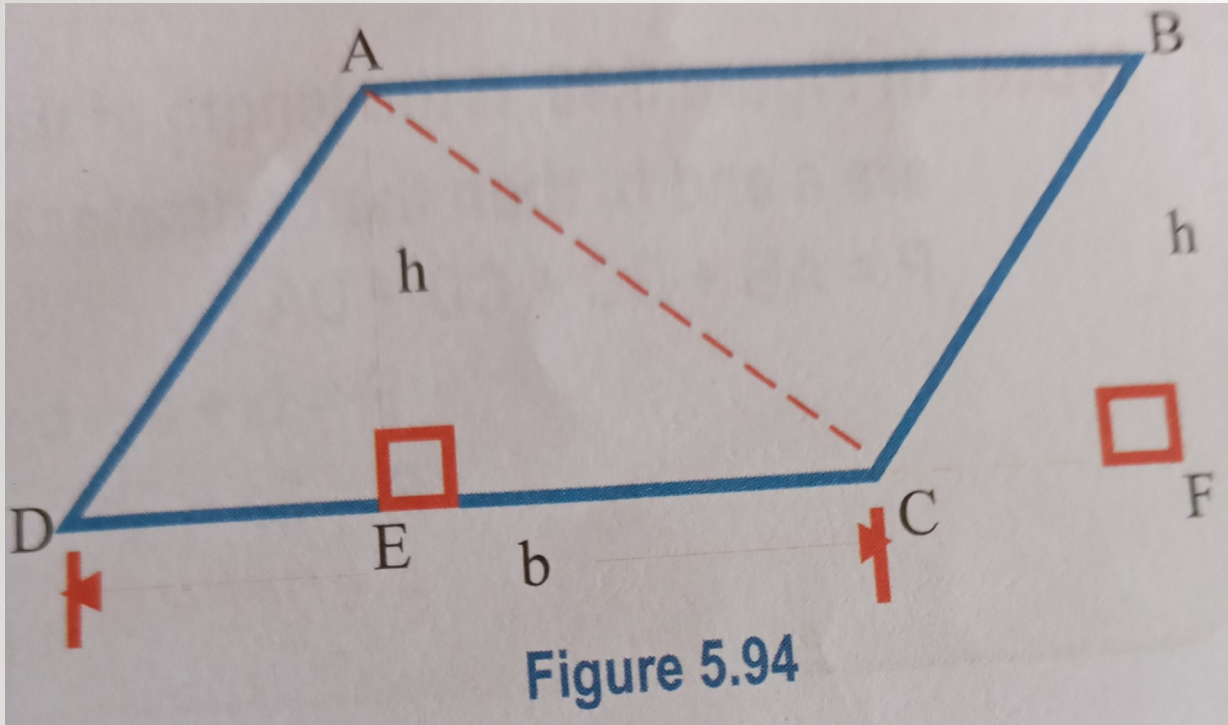
$$\frac{h}{2}(b1 + b2)$$

The perimeter (P) of the trapezium equals:

$$P = AB + BC + CD + DA$$

$$P = a + b + c + d$$

5.3.3 Perimeter & Area of Parallelogram



$$\begin{aligned} \text{Thus } a(ABCD) &= a(\triangle ADC) + a(\triangle ABC) \\ &= \frac{1}{2}(DC \times AE) + \frac{1}{2}(AB \times BF) \\ &= \frac{1}{2}(bh) + \frac{1}{2}(b h) \end{aligned}$$

DC = AB = b, because opposite sides of a parallelogram are equal.

$$= \frac{2}{2}bh$$

$$= bh$$

✓ The perimeter **P** of the parallelogram is given by:

$$P = AB + BC + CD + DA$$

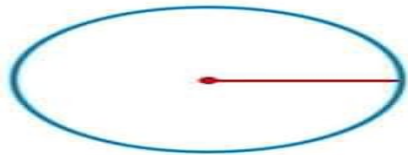
$$P = b + a + b + a$$

$$P = 2a + 2b$$

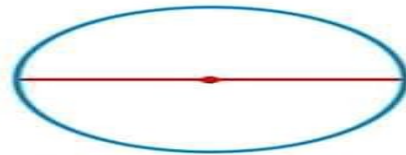
$$\underline{p = 2(a + b)}$$

5.3.4 Circumference of a Circle

Parts of a circle



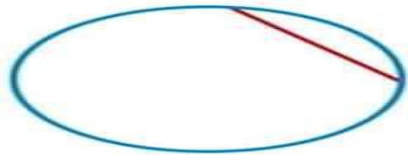
Radius



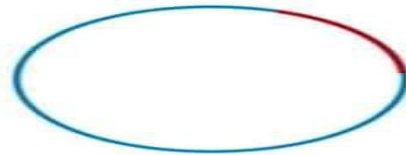
Diameter



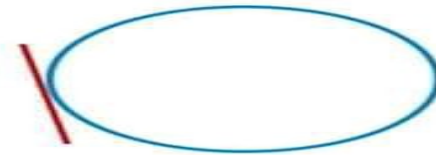
Circumference



Chord



Arc



Tangent



Segment



Sector

**Maths Notes
& Formulas**

✓ The circumference of the circle whose diameter ***d*** is given by:

$$C = \quad \text{or} \quad C = \underline{2r}$$

Where *C*- circumference

d - diameter

r - radius



5.3.5 Area of a Circle

✓ The area of the rectangle = **length** x **width**

=

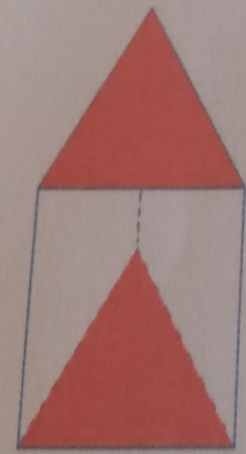
=

- Therefore, Area of the circle =

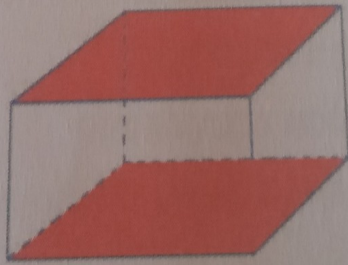
5.3.6 Surface Area of Prism & Cylinder

Prisms

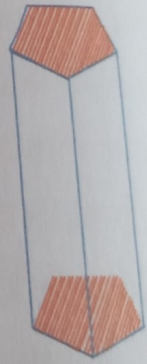
- A **prism** is a solid figure that has two parallel & congruent bases.
- A prism can be named based on its base like triangular prism, rectangular prism, pentagonal prism.
- A prism has two bases: **upper base & lower base**.



Triangular prism (the bases are triangles)



Rectangular prism (the bases are rectangles)



Pentagonal prism (the bases are pentagons)

Figure 5.116

Figure 5.117 to the right.

- ✓ The rectangular region ABCD is the **upper base** and rectangle EFGH is the **lower base**.
- ✓ The line segments $\overline{AB}, \overline{BC}, \overline{CD}, \overline{DA}, \overline{EF}, \overline{FG}, \overline{GH}$ and $\overline{HE}$ are **edges of the bases** where as $\overline{AE}, \overline{BF}, \overline{CG}$ and $\overline{DH}$ are the **lateral edges** of the prism.
- ✓ The rectangles ABFE, BCGF, CDHG and ADHE are called the **lateral faces** of the prism.

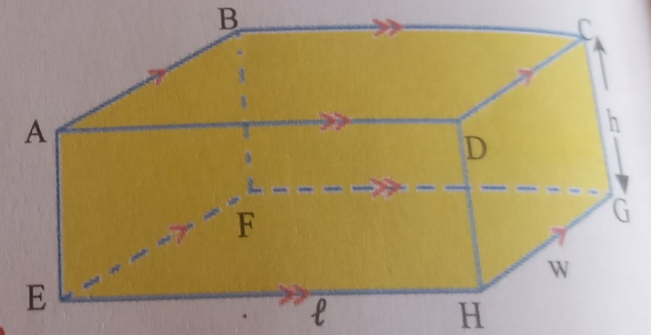


Figure 5.117 rectangular prism

• Lateral Surface Area of Prism

The lateral surface area is the sum of the areas of all lateral faces; denoted by **As**.

$$As = a(ABFE) + a(BCGF) + a(CDHG) + a(ADHE)$$

$$= wh + lh + wh + lh$$

$$= 2lh + 2wh$$

$$= 2h(l+w) \dots\dots\dots \text{where } 2(l+w) = p$$

$$= ph \text{ where } p = \text{perimeter of the base}$$





Total Surface Area of a Prism

- ✓ A rectangular prism has six faces: **two bases & four lateral faces.**
- ✓ **Total Surface area = area of two base + area of the four lateral faces**
- ✓ **$AT = a(ABCD) + a(EFGH) + a(ABFE) + a(BCGF)$**

$$+ a(CDHG) + a(ADHE)$$

$$AT = lw + lw + wh + lh + wh + lh$$

$$AT = 2lw + 2wh + 2lh$$

$$AT = 2(lw + wh + lh)$$

- ✓ **Note: The total surface area is the sum of the areas of all the faces denoted by AT.**
- ✓ **Lateral surface area is the sum of the areas of all lateral faces.**
- ✓ **Total Surface area = $2lw + 2wh + 2lh$**

$$\text{but } 2wh + 2lh = A_s$$

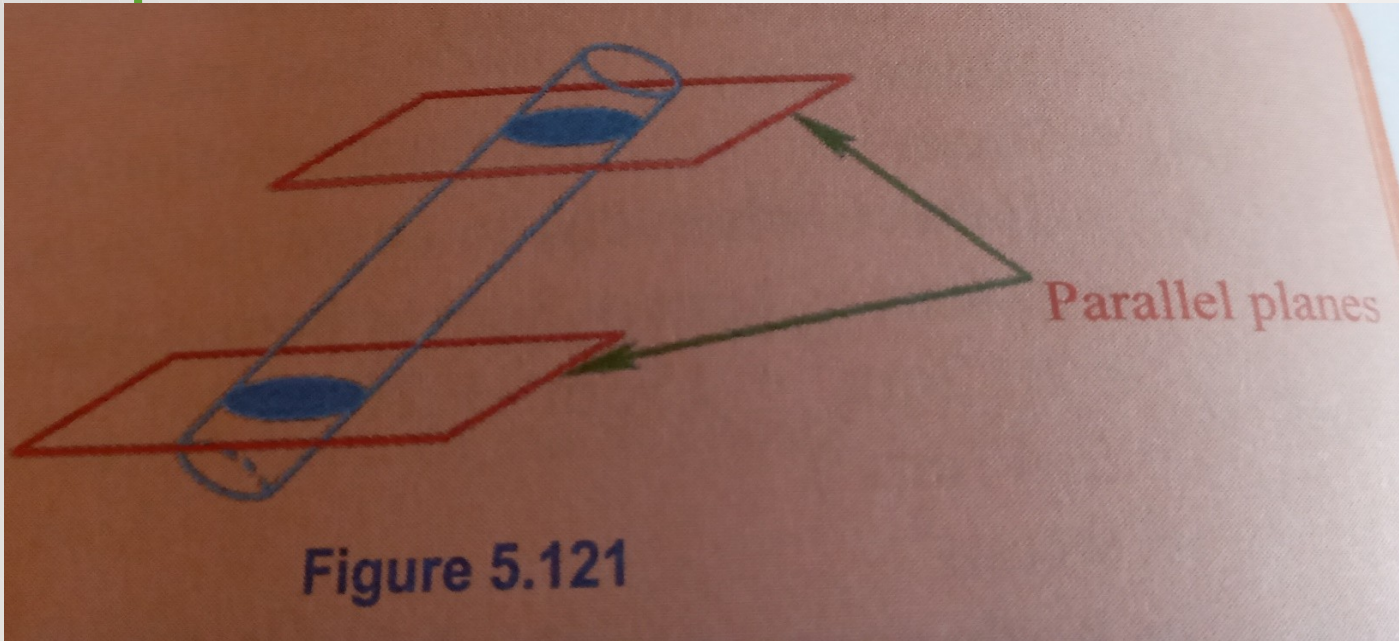
$$\text{so, } AT = A_s + 2lw \text{ here } 2lw = 2A_b$$

$$AT = A_s + 2A_b$$



Cylinders

- is a solid figure whose upper and lower bases are congruent simple closed curves on parallel lines.



Inter Surface Area of a Cylinder

- ✓ In general, for any circular cylinder,
- ✓ The area of the bases: $2AB=2_$
- ✓ The area of the lateral surface(A_s)= h



✓ The total surface area of the cylinder whose base radius ***r*** is:

$$AT = 2AB + AS$$

$$AT = 2r + h$$

$$\underline{AT = (r+h)}$$

5.3.7. Volume of Prism & Cylinder

✓ The volume(*V*) of a rectangular prism equals the product of its ***length(l)***, ***width(w)*** and ***height(h)***.

Volume of rectangular prism

$$= \text{length} \times \text{width} \times \text{height}$$

$$= \text{Volume: } V = l \times w \times h$$

- ***The length, width and height of a cube are the same size (equal).***
- ***Volume of cube = length $\times$ length $\times$ length***

$$V = l \times l \times l =$$

- ✓ *The volume of any prism equals the product of its base area its base area and altitu*



$$V = ABh \text{ where } AB = \text{base area \&}$$

h = height

Volume of Cylinder

- ✓ ***A circular cylinder** is a special prism where the base is a circle.*
- ✓ *The area of the base with radius **r** is*
- ✓ *So its volume = **base area x height***

$$= \times h$$

$$= \underline{h}$$

THANK YOU !!!!!

