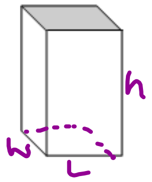
Lesson 46 ~ Lateral & Total Area

Right Prism, Right Pyramid & Right Cylinders

Area of Right Prisms

The given right prism, with height __h__, has a rectangular base with dimensions __L__ and __w__.



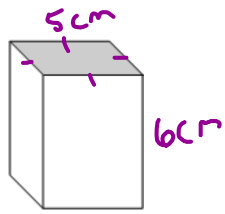
The area of the __lateral faces__ is called the __A_L__.

The lateral area is equal to the product of the perimeter of the base __P_b__ and the height __h__ of the prism.

Formula
Lateral Area of Right Prism

$$\boxed{A_L = P_b h}$$

Example



$$A_L = P_b h$$
$$= 5(4)(6)$$
$$= 20(6)$$
$$= 120\ cm^2$$

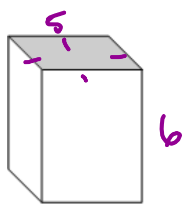
The sum of the areas of the 2 bases and the lateral area is called the __Total Area__.

$$A_T = A_L + A_b + A_b$$

Formula
Total Area of Right Prism

$$\boxed{A_T = A_L + 2A_b}$$

Example



$$A_T = A_L + 2A_b$$
$$= 120 + 2(5^2)$$
$$= 120 + 2(25)$$
$$= 120 + 50$$
$$A_T = 170\ cm^2$$

Area of Right Regular Pyramid

The lateral area A_L of the pyramid is equal to half of the product of the perimeter of the base P_b and the slant height SH of the pyramid.

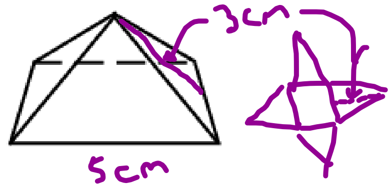
Formula
Lateral Area of Pyramid

$$\boxed{A_L = \frac{P_b(SH)}{2}}$$

Example $A_L = \frac{P_b(SH)}{2}$

$= \frac{(5)(4)(3)}{2}$

$= \frac{60}{2} = 30cm^2$



The total area A_T of the pyramid is equal to the sum of the area of the base A_b and the lateral area A_L.

Formula
Total Area of Pyramid

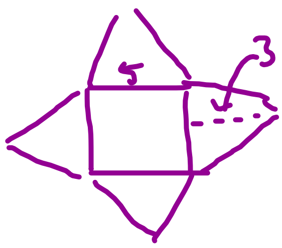
$$\boxed{A_T = A_L + A_b}$$

Example $A_T = A_L + A_b$

$= 30 + 5^2$

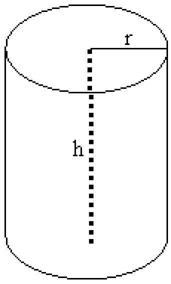
$= 30 + 25$

$A_T = 55cm^2$



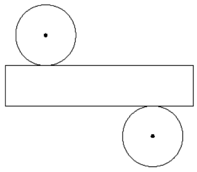
Area of Right Circular Cylinders

The cylinder on the right has a height of h and radius of r.



The net of this cylinder is composed of ….

- 2 discs
- 1 rectangle (lateral face)



The cylinder's lateral area A_L is equal to the product of the perimeter of the base P_b and the height of the cylinder h.

Formula

Lateral Area of cylinder

$$A_L = P_b h$$
$$= 2\pi r h$$

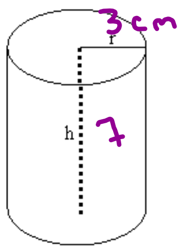
Example

$A_L = 2\pi r h$

$= 2(3.14)(3)(7)$

$= 18.84(7)$

$= 131.88 \text{ cm}^2$



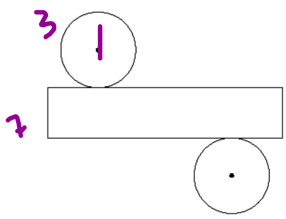
The cylinder's total area A_T is equal to the sum of the areas of the 2 bases A_b and the cylinder's lateral area A_L.

Formula

Lateral Area of cylinder

$$A_T = A_L + A_b + A_b$$
$$= 2\pi r h + 2\pi r^2$$

Example



$A_T = 2\pi r h + 2\pi r^2$

$= 131.88 + 2(3.14)(3^2)$

$= 131.88 + 56.52$

$= 188.4 \text{ cm}^2$

Homework

Act. Booklet P. 86-91