

Geometry Question .

1. In Figure 1,  $\angle BAC = 90^\circ$ .  $AD \parallel BC$ . Prove that  $AB^2 + CD^2 = BD^2 + AC^2$ .

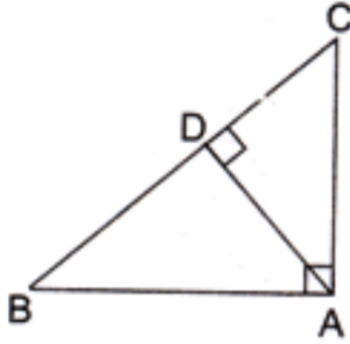


Figure 1: 1

2. In Figure 2,  $PT = 6$  cm,  $AR = 5$  cm. Find the length of  $PA$ .

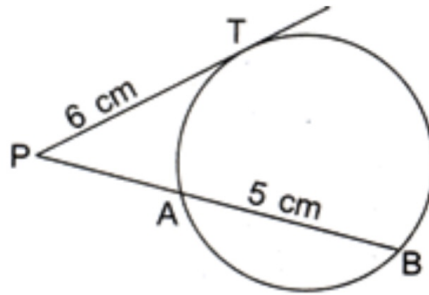


Figure 2: 2

3. Draw the graphs of the following equations:  $3x - 4y + 6 = 0$ ,  $3x + y - 9 = 0$  Also, determine the co-ordinates of the vertices of the triangle formed by these lines and the x axis.
4. A solid is in the form of a right circular cylinder with hemispherical ends. The total height of the solid is 58 cm and the diameter of the cylinder is 28cm. Find the total surface area of the solid  $\pi \approx \frac{22}{7}$
5. . Construct a triangle  $ABC$  in which  $BC = 7$  cm, and median  $AD = 5$  cm,  $\angle A = 60^\circ$  Write the steps of construction also.



- 
- A diagram of a parallelogram with vertices labeled A (bottom-left), B (bottom-right), C (top-right), and D (top-left). The diagonals AC and BD are drawn, intersecting at point E in the center of the parallelogram.

Figure 4: 4

in fig:4,  $ABCD$  is a fig:4 rhombus. prove that  $4AB^2 = AC^2 + BD^2$ .

- 2

which this chord makes with the given line are equal respectively to the angles formed in the corresponding alternate segments. Using the above, do the following:

$AB$  is a diameter and  $AC$  is a chord of a circle such that  $\angle BAC = 30^\circ$ . The tangent at  $C$  intersects  $AR$  produced in a point  $I$ . Prove that  $BC = RD$ .

10. A man standing on the deck of a ship, which is 10 m above the water level, observes the angle of elevation of the top of a hill as  $60^\circ$  and the angle of depression of the base of the hill as  $30^\circ$ . Calculate the distance of the hill from the ship and the height of the hill.
11. From a window  $x$  meters high above the ground in a street, the angles of elevation and depression of the top and foot of the other house on the opposite side of the street are  $\alpha$  and  $\beta$  respectively. Show that the height of the opposite house is  $x(1 + \tan \alpha \cot \beta)$  meters.