IB Math Studies 2 -- Do this now:

A rectangle has length 2.6×10^4 and width 1.9×10^4. Find each of the following, giving your answer in the form $a \times 10^k$, where $1 \leq a < 10$ and $k \in \mathbb{Z}$.

(a) The area of the rectangle;

(b) The perimeter of the rectangle.

$2(L \times W) + 2(W)$

$2(1.9 \times 10^4) + 2(2.6 \times 10^4)$

$= 9 \times 10^4$

9.0×10^4

2.6×1.4

234

260

3.64

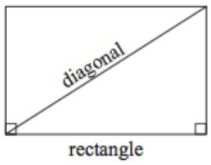
4.94×10^8

Questions on the assignment?

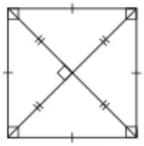
Exercise 12 A # 3 a-c, # 4 e-f, # 5 d-f, # 6,7,8,9 all

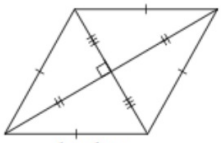
B RIGHT ANGLES IN GEOMETRY

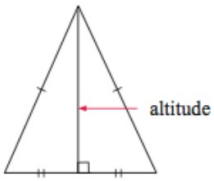
In many geometric figures, we can make right-angled triangles and thus use the Pythagorean Theorem to find lengths.



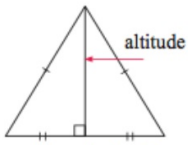
rectangle


square


rhombus

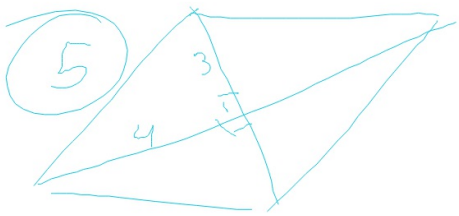


isosceles triangle



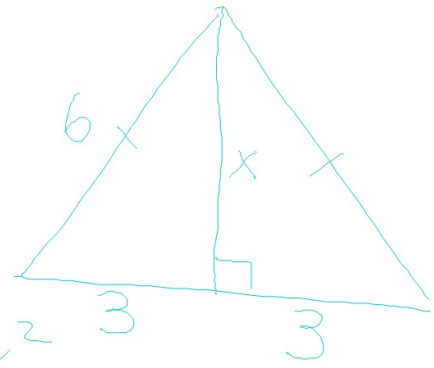
equilateral triangle

A rhombus has diagonals of length 6 cm and 8 cm. Find the length of its sides.



a Find the altitude of an equilateral triangle with sides 6 m long.

b Hence find the area of the triangle.



$6^2 = 3^2 + x^2$

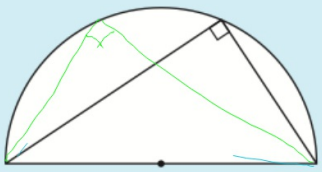
$36 = 9 + x^2$

$27 = x^2$

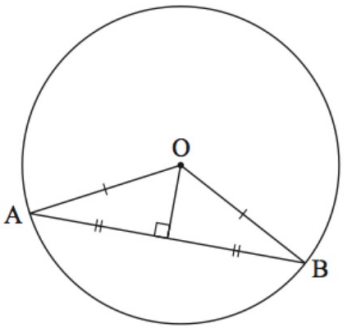
$3\sqrt{3} = x$

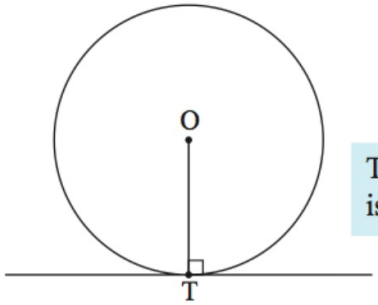
Right angles in circles:

The angle in a semi-circle is always a right angle.



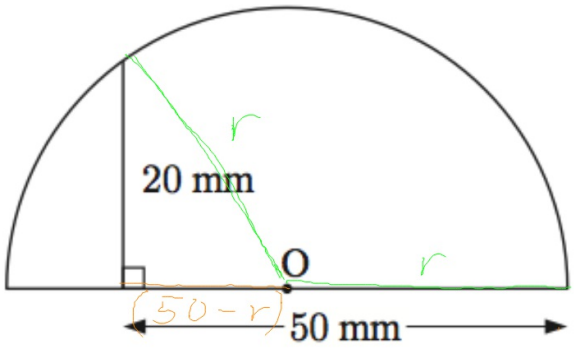
The line drawn from the centre of a circle at right angles to a chord, bisects the chord.





The radius from the centre of a circle to the point of contact is at right angles to the tangent.

Find the radius of this semi-circle.



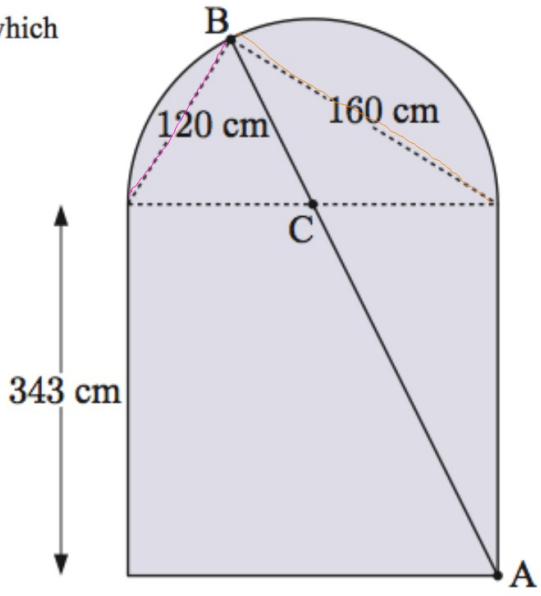
$20^2 + (50 - r)^2 = r^2$

The doorway alongside is rectangular at the bottom with a semi-circular arch at the top.

a Find the radius of the semi-circle.

b Find the length of line segment AC.

c Hence find the length of the line segment AB which passes through the circle's centre C.



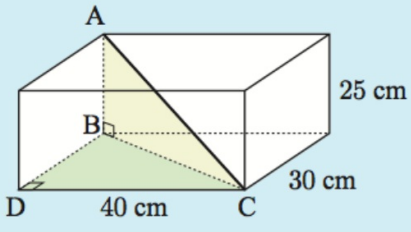
C THE CONVERSE OF PYTHAGORAS' THEOREM

If we know all the side lengths of a triangle, we can determine whether the triangle is right angled by using the **converse of Pythagoras' theorem**.

If a triangle has sides of length a, b, and c units and $a^2 + b^2 = c^2$, then the triangle is right angled.

E THREE-DIMENSIONAL PROBLEMS

Skyways Airlines has the policy that passengers cannot carry on luggage with diagonal measurement of more than 56 cm. Katie's bag is 40 cm × 30 cm × 25 cm. Is she allowed to carry it on board the plane?



A pyramid of height 40 m has a square base with edges 50 m long. Determine the length of the slant edges.

Review Set 12 C