C USING TRIGONOMETRY IN GEOMETRIC FIGURES

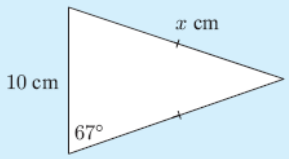
We can use trigonometry to find unknown lengths and angles in special geometric figures which contain right angled triangles.

ISOSCELES TRIANGLES

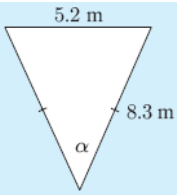
To use trigonometry with isosceles triangles we draw the **perpendicular** from the apex to the base. This altitude **bisects** the base.

Find the unknowns in the following diagrams:

a

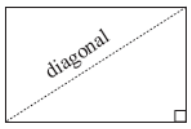


b

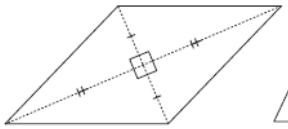


SPECIAL QUADRILATERALS

Right angled triangles can also be found in special quadrilaterals such as rectangles, rhombi, trapezia, and kites.

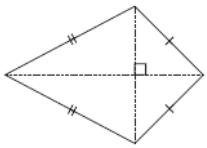


rectangle



rhombus

trapezium or trapezoid



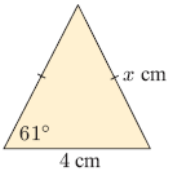
kite

A rhombus has diagonals of length 10 cm and 6 cm. Find the smaller angle of the rhombus.

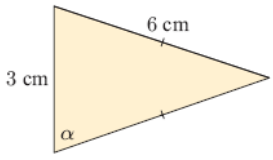
Part I

1 Find, correct to 3 significant figures, the unknowns in the following:

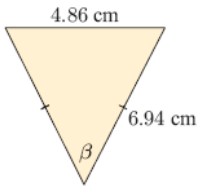
a



b



c

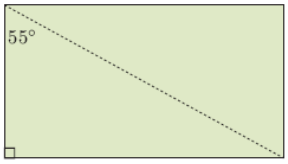


2 A rectangle is 9.2 m by 3.8 m. What angle does its diagonal make with its longer side?

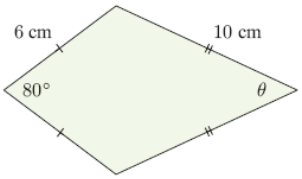
3 The diagonal and the longer side of a rectangle make an angle of 43.2°. If the longer side is 12.6 cm, find the length of the shorter side.

5 The smaller angle of a rhombus measures 21.8° and the shorter diagonal has length 13.8 cm. Find the lengths of the sides of the rhombus.

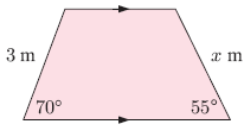
6 A rectangular field is 20 metres longer than it is wide. When Patrick walks from one corner to the opposite corner, he makes an angle of 55° with the shorter side of the field. Find the width of the field.



7 Find θ.

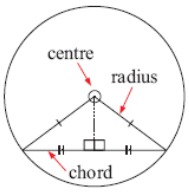


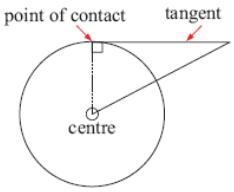
8 **a** Find the value of x:

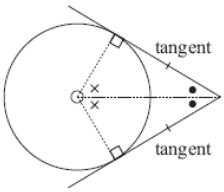


CHORDS AND TANGENTS (EXTENSION)

Right angled triangles also occur in chord and tangent problems.



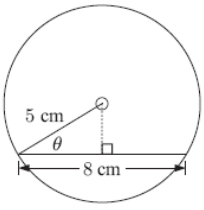




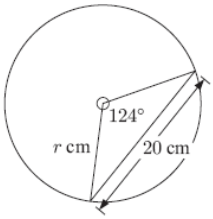
Ex A chord of a circle subtends an angle of 112° at its centre. Find the length of the chord if the radius of the circle is 6.5 cm.

1 Find the value of the unknown in:

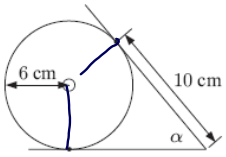
a



b



c



2 A chord of a circle subtends an angle of 89° at its centre. Find the length of the chord given that the circle's diameter is 11.4 cm.