

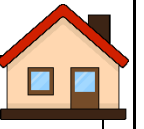


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VCE Specialist Mathematics ½
Trigonometry I [3.1]
Homework

Homework Outline:

Compulsory Questions	Pg 2 – Pg 17	
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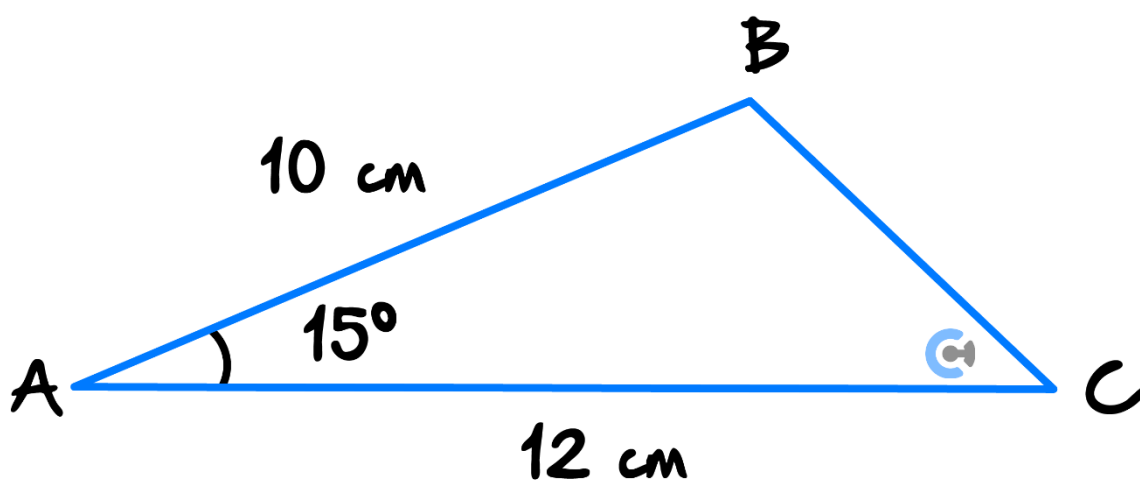
Section A: Compulsory Questions

Sub-Section [3.1.1]: Find Lengths, Angles and Area of Triangles Using Sine and Cosine Rule

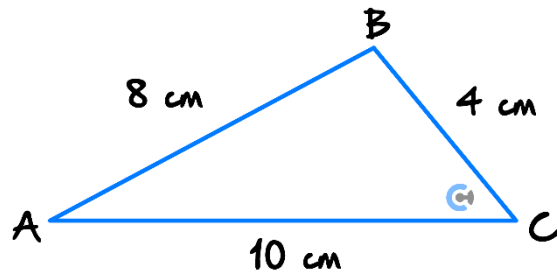
Question 1

You may use a CAS for the following questions. Give your answers correct to two decimal places.

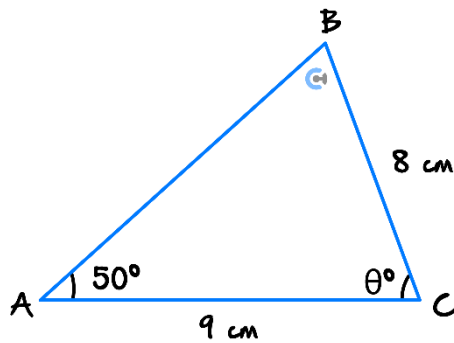
- a. Find the length of BC in the following triangle.



- b. Find the angle BAC in the following triangle.



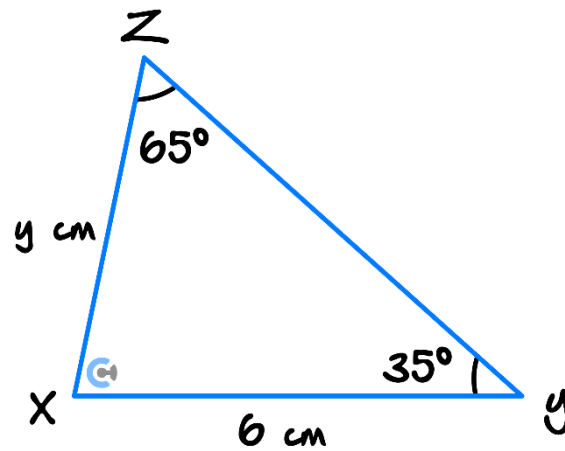
- c. Find the angle θ in the following triangle given that $\angle ABC$ is acute.





Question 2

Find the area of the following triangle. Give your answer correct to two decimal places.

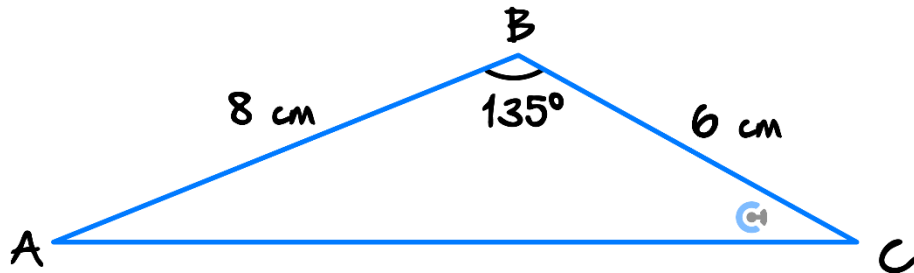


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Question 3



Find all side lengths and angles for the following triangle. Give your answers correct to two decimal places.



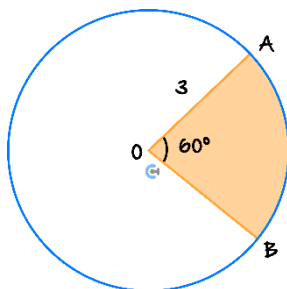
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Sub-Section [3.1.2]: Find Arc Lengths, Chord Lengths, Sector and Segment Areas

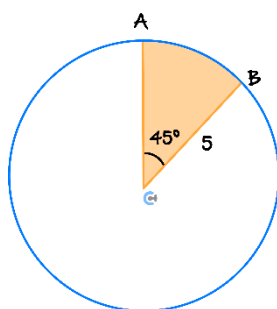
Question 4

Consider the following circles:

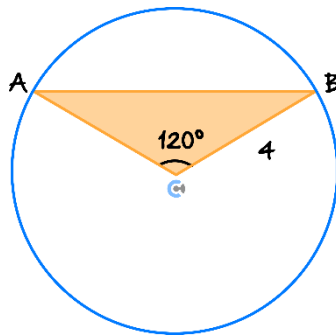
- a. Find the area of the shaded sector.



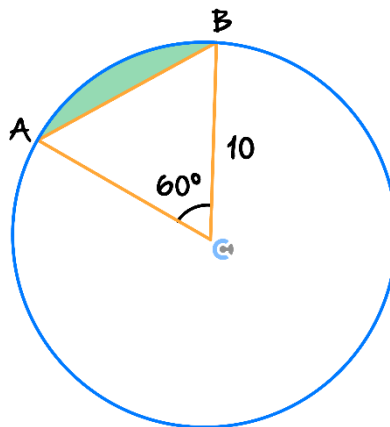
- b. Find the length of the arc AB .



c. Find the length of the chord AB .



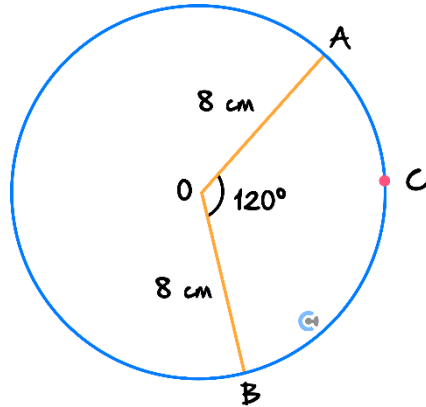
d. Find the area of the shaded segment.





Question 5

The circle shown has a centre O and radius length 8 cm . The angle subtended at O by arc ACB has magnitude 120° .



- a. Find the exact length of the chord AB .

- b. Find the exact length of the arc ACB .

- c. Find the exact area of the minor sector AOB .

d. Find the magnitude of the angle AOC , in degrees, if the minor arc has a length 3 cm . Give your answer in degrees correct to two decimal places.

Question 6



Two circles both with a radius of 6 cm have their centres 10 cm apart. Calculate the exact area of the region common to both circles and then round this result to two decimal places.

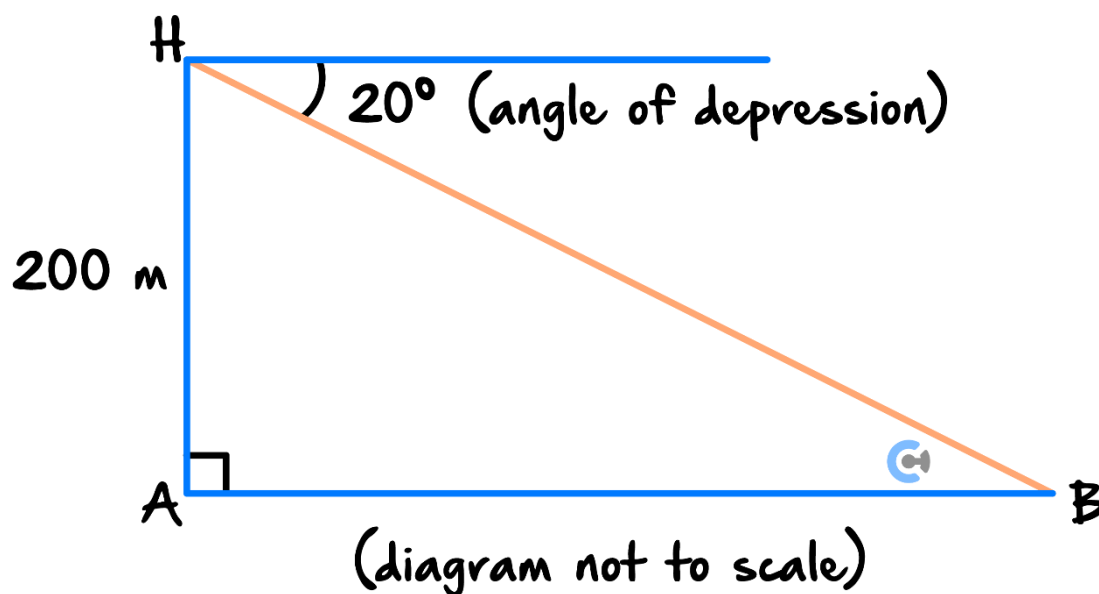
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Sub-Section [3.1.3]: Apply Angle of Elevation/Depression and Bearing to Solve Geometric Problems (Only 2D)

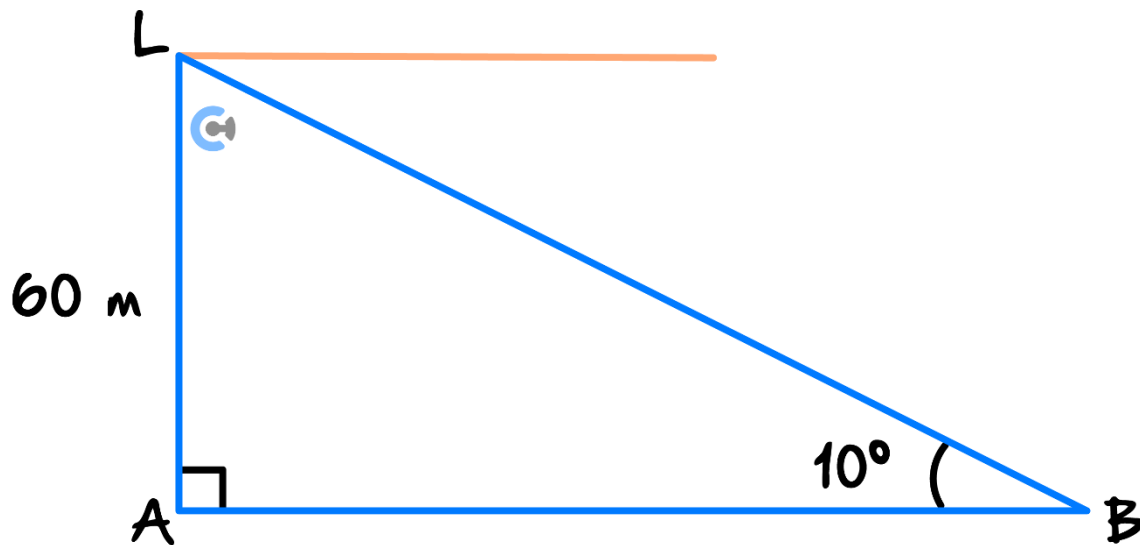
Question 7



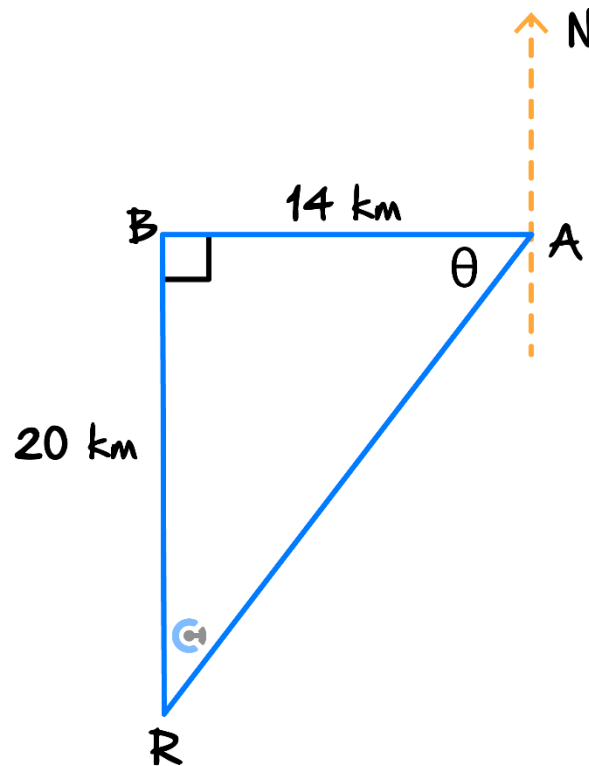
- a. A passenger in a hot air balloon flying at 200 m observes a boat at an angle of depression of 20° , as shown in the diagram below. Calculate the horizontal distance between the balloon and the boat correctly to the nearest metre.



- b. The light shining at the top of a lighthouse is known to be 60 m above sea level. The light is observed from a boat at an angle of elevation of 10° . The situation is shown in the diagram below. Calculate the horizontal distance from the boat to the bottom of the lighthouse, correct to the nearest metre.



- c. The road from Alphaville runs due west for 14 km to Betaville. A monument to Bertrand Russell is located 20 km due south of Betaville. The situation is shown in the diagram below. Calculate the distance and bearing of the monument from the centre of Alphaville give your answers correct to two decimal places.



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Question 8

A person standing on top of a sea cliff that is 60 m high is in line with two buoys whose angles of depression are 14° and 16° . Calculate the distance between the buoys. Give your answer correct to two decimal places.

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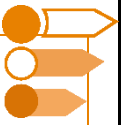


Question 9

From a ship A , two other ships B and C are on bearings of 300° and 050° respectively. The distance BA is 6 km and the distance CA is 5 km . Find the distance BC . Give your answer correct to two decimal places.

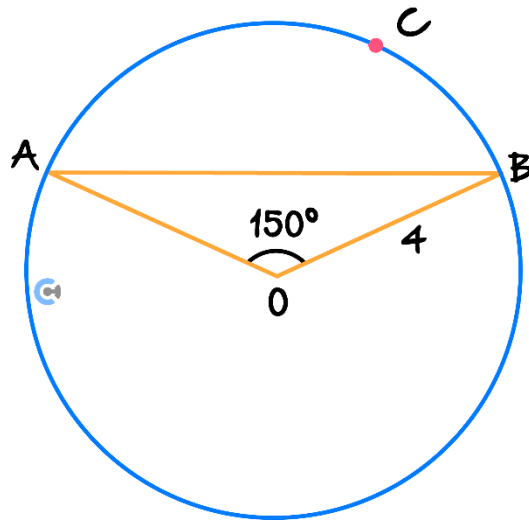
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Sub-Section: The 'Final Boss'



Question 10

Consider a circle of radius 4, and centre O . The angle subtended at O by the arc AB has a magnitude of 150° . Exact answers are required for all parts and no CAS allowed.



a.

- i. Find the length of the chord AB .

ii. Find the length of the arc AB .

b. Find the area of the minor segment formed by the chord AB .

- c. The point C is located between A and C such that it divides the arc AB in a 2:1 ratio. Find the length of the arc CB and the angle BOC in degrees.

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