

Subject: Year 12 Mathematics Standard 2	Task Number: 2
Type of Task: In Class Task	Coordinating Teacher: Mrs Judith Davis Cooperating Teacher: Miss Simone Parkinson, Mrs Lisa Bendall, Mr Kali Ratu Roraduri
Date Issued: Term 1 Week 7 Tuesday 12 th March 2024	Date Due: Term 1 Week 9 Thursday 28 th March 2024
Total Marks: 45 Marks	Weighting: 25%
Submission Instructions: <i>Students are to complete their test in period 2 on Thursday 28th March. The test MUST be submitted upon completion and is not to be removed from the classroom.</i>	
Task Context:	
<i>In the topic 'Non Right Angle Trigonometry', you have learnt to solve problems in right angled and non right angled triangles in a variety of contexts.</i>	
<i>In this task you will complete a in class task on: Non Right Angled Trigonometry (Cambridge Chapter 4)</i>	
Syllabus Outcomes:	
<i>MS2-12-3 interprets the results of measurements and calculations and makes judgements about their reasonableness, including the degree of accuracy and the conversion of units where appropriate MS2-12-4 analyses two-dimensional and three-dimensional models to solve practical problems MS2-12-10 uses mathematical argument and reasoning to evaluate conclusions, communicating a position clearly to others and justifying a response</i>	
Task Description:	
<i>Each student will be provided a set of practice questions attached to this notification. From these questions, an in-class test will be set which contains:</i>	
<ul style="list-style-type: none"> • 10 marks are allocated from the practice questions • 25 marks are allocated from questions similar to the practice questions • 10 marks are allocated from questions unfamiliar to the practice questions provided • A copy of the Mathematics Standard Reference Sheet will be provided with the test. 	
Criteria for Assessing Learning	
<i>Students will be assessed on their ability to:</i>	
<ul style="list-style-type: none"> • find trigonometric ratios and calculations • calculate the length of an unknown side or an unknown angle in a right angled triangle using Pythagoras or trigonometric ratios • calculate the area of a non right angled triangle • calculate unknown sides and angles in non right angled triangles using the Sine rule or Cosine rule • construct and use compass and true bearings • solve problems involving Pythagoras' theorem, the trigonometry of right angled and non right angled triangles, angles of elevation and depression and the use of true bearings and compass bearings • construct and interpret compass radial surveys and solve related problems • justify solutions with your reasoning 	



ASSESSMENT TASK NOTIFICATION

HSC Key Verbs

Find: identify the solution

Calculate: give a numerical solution

Construct: draw a diagram

Solve: to find a solution

Justify: support an argument with solutions

NESA "All My Own Work"

By signing for this assessment task and having completed the NESA course "All My Own Work" I confirm that this assessment task will be free from plagiarism and reflective of my own work. I understand that if I am found to have plagiarised or engaged in malpractice, I will be referred to the HT Access to engage the LAP Malpractice process.

Marking Guidelines:

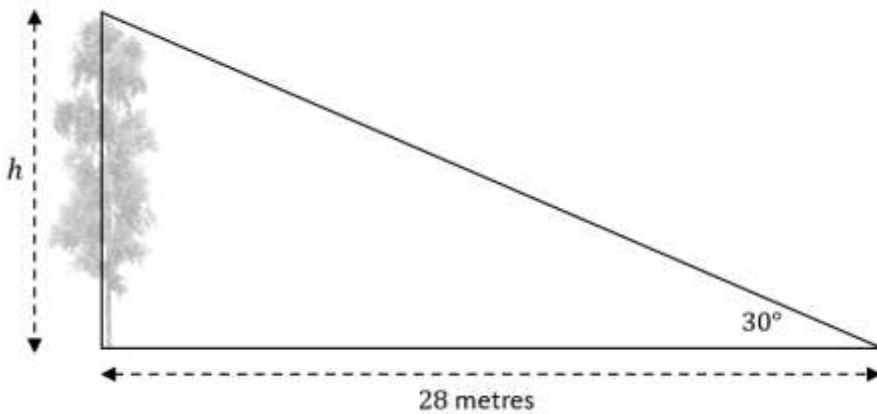
Marks have been allocated on the class test. Marks will not be awarded for bald answers where relevant working is required.

Practice Questions

1. Which compass bearing is the same as a true bearing of 110° ?

- A. $S20^\circ E$
- B. $S20^\circ W$
- C. $S70^\circ E$
- D. $S70^\circ W$

2. The angle of elevation of the top of a tree from a point P on the ground is 30° . The point P is 28 metres from the base of the tree.



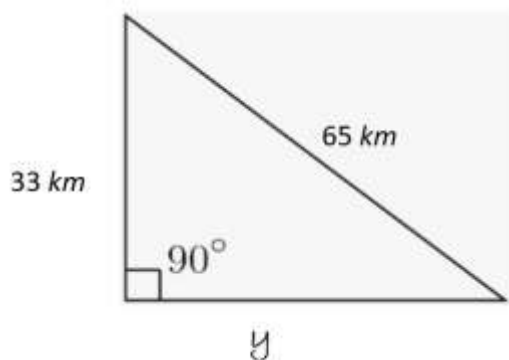
The correct expression for h , the height of the tree, is

- A. $h = 28 \tan 30^\circ$
- B. $h = \frac{28}{\tan 30^\circ}$
- C. $h = 30 \tan 28^\circ$
- D. $h = \frac{\tan 30^\circ}{28}$

3. Calculate the angle to the nearest degree when $\sin \theta = 0.2753$.

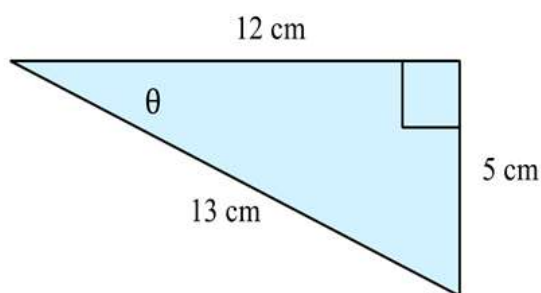
- A. 15°
- B. 16°
- C. 28°
- D. 48°

4. Which answer represents a valid expression of Pythagoras theorem for this triangle.



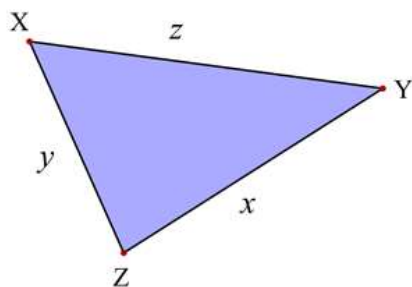
- A. $y^2 = 65^2 - 33^2$
- B. $y^2 = 65^2 + 33^2$
- C. $y^2 = \sqrt{65^2 - 33^2}$
- D. $y^2 = \sqrt{65^2 + 33^2}$

5. In the diagram what is the value of $\sin \theta$



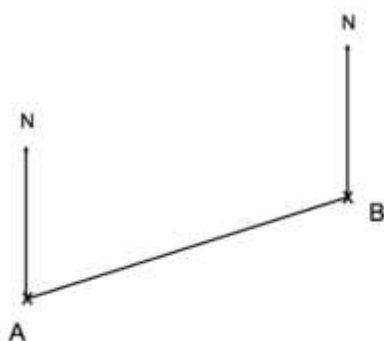
- A. $\frac{5}{12}$
- B. $\frac{12}{5}$
- C. $\frac{12}{13}$
- D. $\frac{5}{13}$

6. The angle at Z is found to have a cosine value of (-0.1)
 What is the most likely size of the angle at $\angle XZY$?



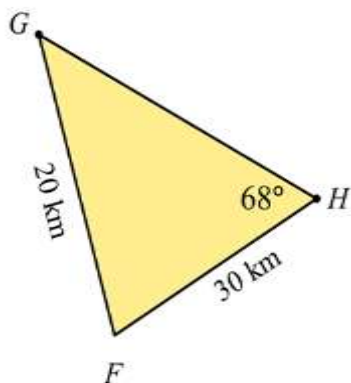
- A. 6°
- B. 60°
- C. 84°
- D. 96°

7. In this diagram A and B represent the location of two ships at sea.
 The lines labelled N indicate the bearing 0°T or True North.
 Which answer is a possible bearing of A from B?



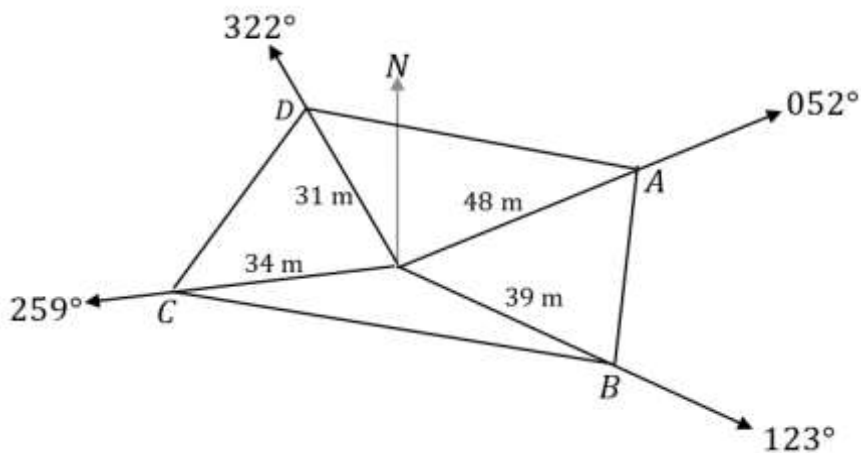
- A. 70°T (T = True)
- B. 110°T
- C. 250°T
- D. 290°T

8. Which of the following equations is the correct application of the Sine Rule to find the size of angle G?



- A. $\frac{\sin G}{20} = \frac{\sin 68^\circ}{30}$
- B. $\frac{\sin G}{68} = \frac{\sin 30^\circ}{20}$
- C. $\frac{\sin G}{30} = \frac{\sin 20^\circ}{68}$
- D. $\frac{\sin G}{30} = \frac{\sin 68^\circ}{20}$

9. The diagram shows a radial survey of a field $ABCD$.

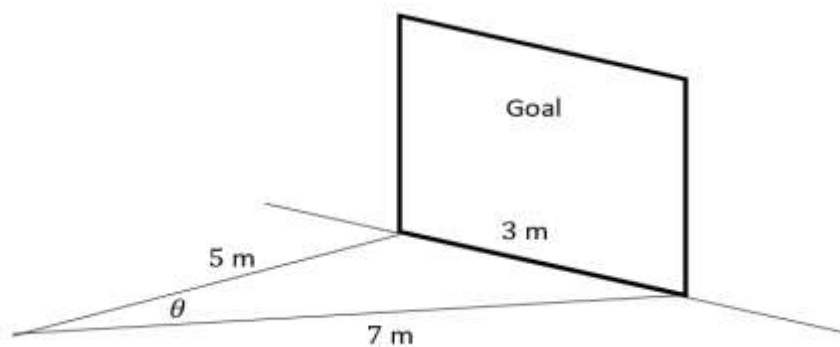


In triangle COB , what is the size of $\angle COB$?

- A. 36°
- B. 73°
- C. 136°
- D. 382°

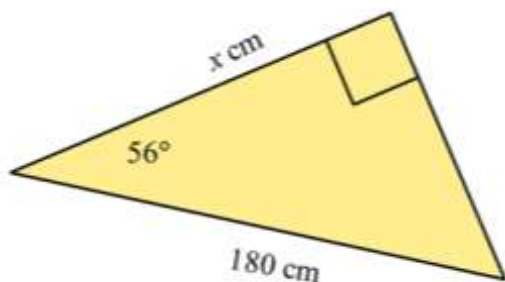
10. In a game of Goal-ball the goal is 3 metres wide. Scott has the ball in a position 5 metres from the closest post and 7 metres from the other post.

What is the size of the angle θ (to the nearest degree)?

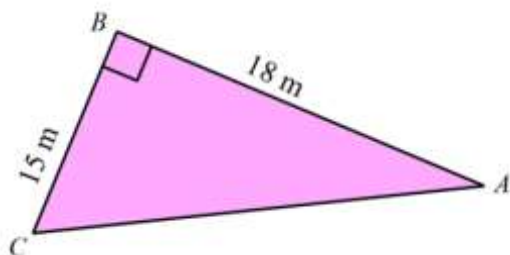


- A. 13°
- B. 22°
- C. 38°
- D. 64°

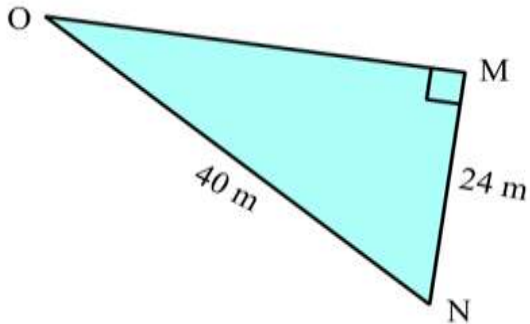
11. Find the value of $\frac{24 \sin 35}{\sin 72}$ correct to two decimal places.
12. Find the value of $5 \cos 19^{\circ}37'$ correct to two decimal places.
13. Evaluate θ if $\tan \theta = 48$ correct to the nearest minute.
14. Calculate x correct to 1 decimal place when $x = 40 \times \cos 75^{\circ}$.
15. $x = \frac{31}{\sin 68^{\circ}} \times \sin 25^{\circ}$ Find x to the nearest whole number.
16. Evaluate θ to the nearest degree when $\sin \theta = 0.53$.
17. Calculate the value of x when $x^2 = 7.5^2 + 5.9^2 - 2 \times 7.5 \times 5.9 \times \cos 42^{\circ}18'$ correct to 1 decimal place.
18. $p^2 = 13^2 + 11^2 - 2 \times 13 \times 11 \times \cos 53^{\circ}$. Find p to the nearest whole number.
19. If $\tan \theta = 85$, what is the value of θ , correct to 2 decimal places.
20. Find the value of x , correct to the nearest cm.



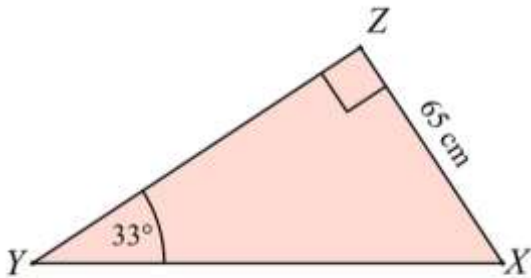
21. Find the size of angle BAC , to the nearest degree.



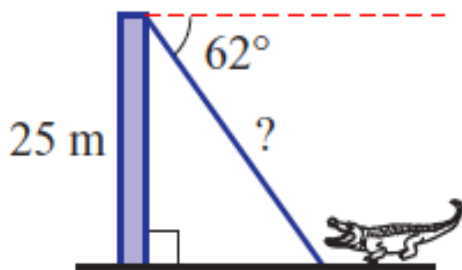
22. Calculate the length of OM.



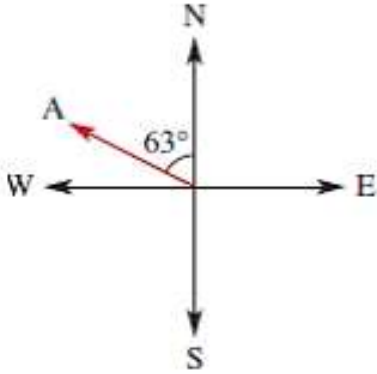
23. Find the length of XY, correct to 1 decimal place.



24. The angle of depression from the top of a 25m tall viewing tower to a crocodile on the ground is 62°. Find the direct distance from the top of the tower to the crocodile, to the nearest metre.

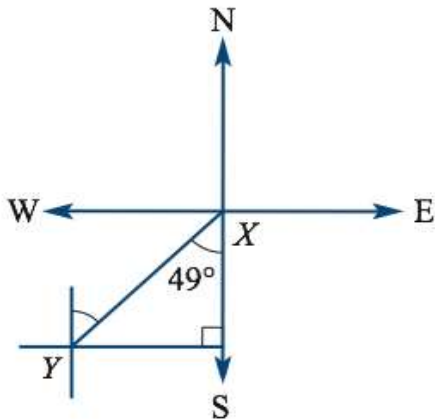


25. What is the compass bearing of A from the centre point?

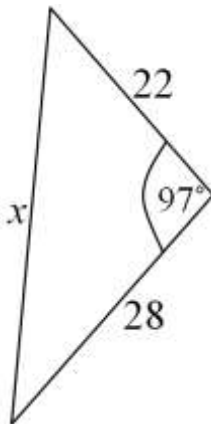


26. The compass bearing of Y from X is $S49^\circ W$.

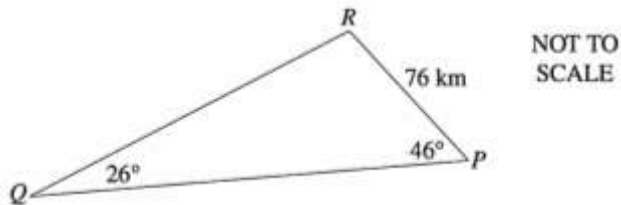
What is the true bearing of X from Y?



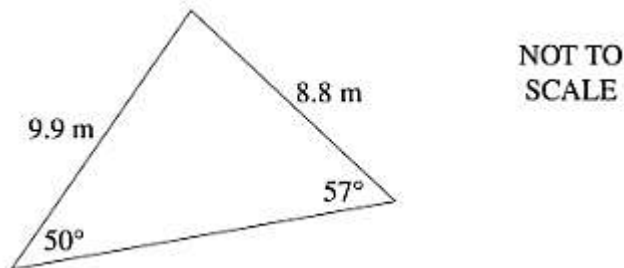
27. Calculate x correct to 2 decimal places.



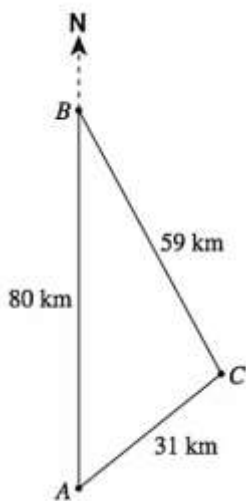
28. Calculate the distance from P to Q to the nearest kilometre.



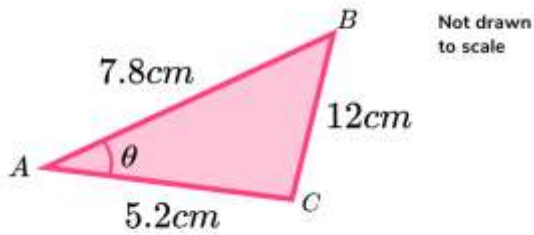
29. Calculate the area of the triangle to 1 decimal place.



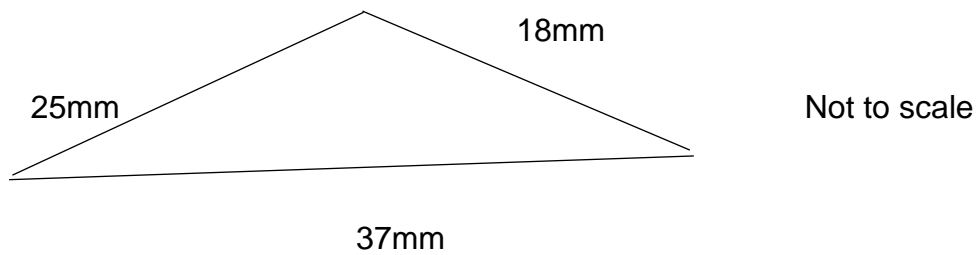
30. Point B is 80km North of Point A.
 Point C is 31 km from Point A and 59km from Point B.
 What is the true bearing of C from B to the nearest degree?



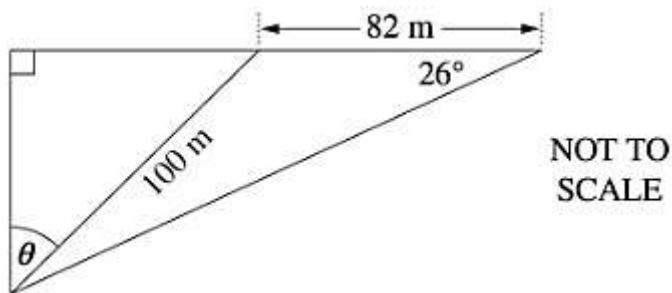
31. Use the cosine rule to evaluate the size of the angle marked θ to the nearest degree.



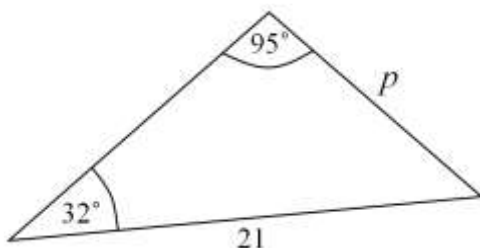
32. The largest angle in the triangle below is obtuse (θ). What is the value of the obtuse angle to the nearest degree?



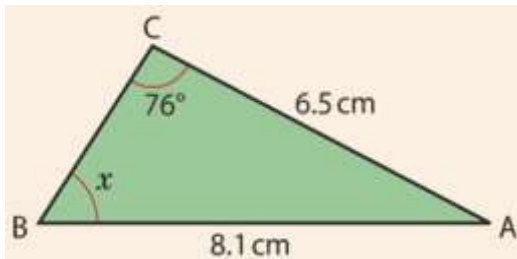
33. What is the value of θ , to the nearest degree.



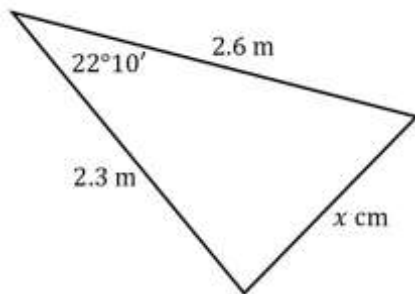
34. Calculate the length, p , to the nearest metre.



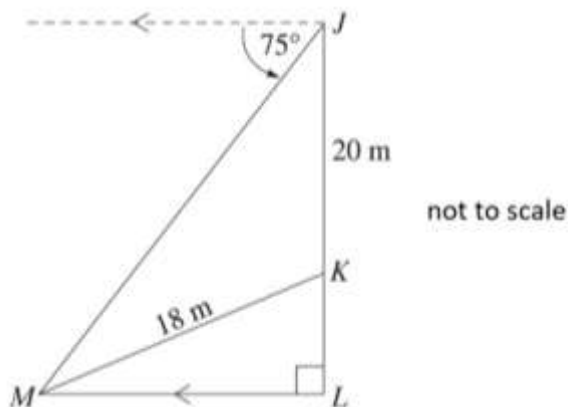
35. Calculate the value of the angle, x , to the nearest degree.



36. Calculate x correct to 2 decimal places.

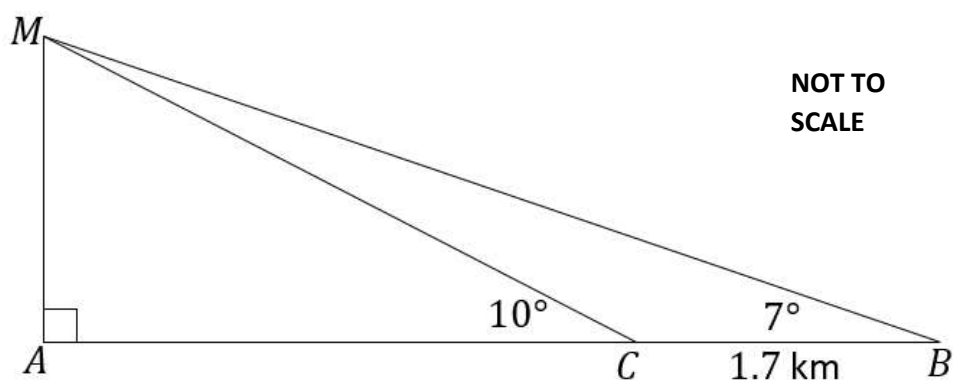


37. The angle of depression from J to M is 75° . The length of JK is 20 m and the length of MK is 18 m.



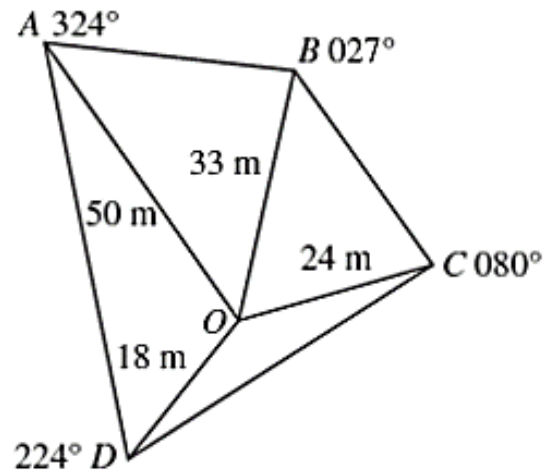
Calculate the angle of elevation from M to K . Give your answer to the nearest degree.

38. During a hike in the mountains, Miriam recorded the angle of elevation from various points to the top of a mountain, M . From a point B , the angle was 7° . From another point C on the same level as B , the angle was 10° . The point C was 1.7 km closer to the base of the mountain than was B . The following diagram represents this information. In the diagram, AM represents the height of the mountain, and ACB is a straight line.



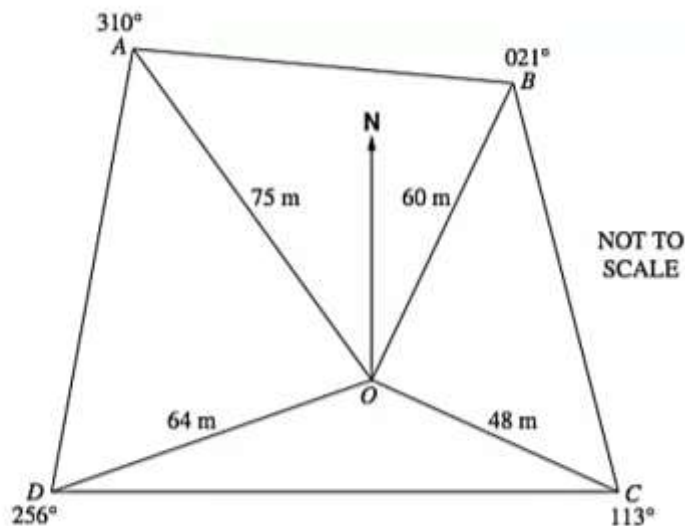
- Show that the size of $\angle BMC = 3^\circ$
- Calculate the length of CM to two decimal places.
- Find the height of the mountain (to the nearest metre).

39. ABCD represents an area of land.



- Calculate $\angle AOB$.
- What is the length of AB correct to one decimal place?
- Calculate the area of $\triangle AOB$, to 2 decimal places.

40. A compass radial survey of the field ABCD has been conducted from O.



- Calculate the size of $\angle AOB$.
- Calculate the area of $\triangle DOC$ to the nearest square metre.
- Calculate the length of DC to one decimal place.