

IB Maths AA SL Unit 3 Geometry and Trigonometry Practice Exam

IB Mathematics: Analysis and Approaches SL · 9 questions · 55 marks

Name _____

Date _____

Score / 55

- Answer every question. Show your working: most marks are for method.
- Section A no calculator; Section B calculator allowed.
- Topics: Geometric Mensuration and Ratios; Unit Circle Exact Values; Cosine Rule calculations; Sine Rule and ambiguous case.
- The mark scheme is a separate free PDF: ibmathrevision.com/downloads/practice-exams/slaa/ib-maths-aa-sl-unit-3-geometry-trigonometry-practice-exam-mark-scheme.pdf

Section A: no calculator

- From a point P on level ground, the angle of elevation of the top of a vertical tower is 30° . The point P is 60 m from the foot of the tower. [4]
 - Find the exact height of the tower. [2]
 - Find the exact distance from P to the top of the tower. [2]
- A hiker walks 8 km from A to B on a bearing of 045° . [3]
 - Write down the bearing of A from B . [1]
 - Find the exact distance that B is north of A . [2]
- The angle θ satisfies $\frac{\pi}{2} < \theta < \pi$ and $\sin \theta = \frac{5}{13}$. [8]
 - Find the exact value of $\cos \theta$. [3]
 - Find the exact value of $\tan \theta$. [1]
 - Find the exact value of $\sin(\pi + \theta)$ and of $\cos(2\pi - \theta)$. [2]
 - Find the exact value of $\sin 2\theta$. [2]



4. A boat sails 6 km from harbour A on a bearing of 030° to point B , then 10 km on a bearing of 150° to point C . [7]
- a. Show that $\hat{ABC} = 60^\circ$. [2]
 - b. Find the exact distance AC . [3]
 - c. Find the exact area of triangle ABC . [2]

Section B: calculator allowed

5. From the top of a vertical cliff 85 m high, the angle of depression of a boat is 12° . [5]
- a. Find the horizontal distance from the foot of the cliff to the boat. [3]
 - b. A minute later the angle of depression is 20° . Find how far the boat has moved towards the cliff. [2]
6. A ship sails 12 km from port A on a bearing of 070° to a buoy B , then 9 km on a bearing of 160° to a lighthouse C . [7]
- a. Show that $\hat{ABC} = 90^\circ$. [2]
 - b. Find the distance AC . [2]
 - c. Find the bearing of C from A . [3]



7. Points A and B lie on level ground in a straight line with the foot F of a vertical mast FT , with A between B and F and $AB = 50$ m. The angles of elevation of T from A and B are 38° and 25° respectively. [7]

- Find $\hat{ATB}$. [2]
- Find AT . [3]
- Find the height of the mast. [2]

8. In triangle ABC , $BC = 7$ cm, $AC = 10$ cm and $\hat{BAC} = 40^\circ$. [7]

- Find the two possible values of $\hat{ABC}$. [3]
- Find the difference between the two possible areas of the triangle. [4]

9. A vertical tower FT stands on horizontal ground with foot F . From point P , the tower is due north and the angle of elevation of T is 28° . Point Q is 200 m due east of P , and from Q the angle of elevation of T is 20° . Let $PF = x$ m. [7]

- Write down expressions for the height h of the tower in terms of x , using each point. [2]
- Find x . [2]
- Find the height of the tower. [1]
- Find the bearing of F from Q . [2]



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