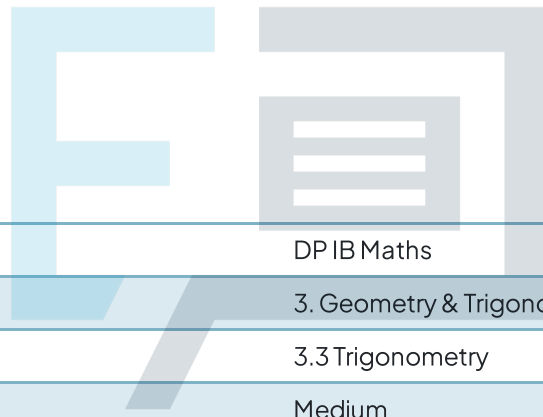




3.3 Trigonometry

Question Paper



Course	DP IB Maths
Section	3. Geometry & Trigonometry
Topic	3.3 Trigonometry
Difficulty	Medium

Exam Papers Practice

To be used by all students preparing for DP IB Maths AI SL
Students of other boards may also find this useful

Question 1a

Owen, Henry and Tom are rugby players passing a ball in a park. Owen is at point O, Henry is at point H and Tom is at point T. The distance between Owen and Henry is 25 m and the distance between Henry and Tom is 18 m. The angle \widehat{OHT} is 96° .

(i)
Draw and label a diagram to represent the situation described above.

(ii)
Find the length of the line OT.

[4 marks]



Question 1b

Find the size of the angle \widehat{OTH} .

Exam Papers Practice [3 marks]

Question 1c

Find the area of the section of the park the players are using to pass the ball.

[3 marks]

Question 2a

A sailboat race takes place annually for under 18's on a large lake. The competitors must sail around five flagged buoys at the points **A**, **B**, **C**, **D** and **E**, in a clockwise direction.

B is due east of **A**, **C** is due south of **B** and **A** is due north of **E**.

The bearing from **A** to **C** is 110° and the bearing from **C** to **D** is 220° .

The distance **AB** = 1200 m, the distance **BC** = 600 m, the distance **CD** = 800 m and the distances **DE** = **EA** = 1000 m.

Draw and label a diagram to show the buoys **A**, **B**, **C**, **D** and **E** and clearly mark the bearings and distances given above.

[3 marks]



Question 2b

The boats all start at **A** and must complete the course 5 times. A support motorboat is present and can travel across the course from **A** to **C** and **A** to **D** in case of an emergency.

Calculate the distance from **A** to **C**.

[2 marks]

Question 2c

Calculate the distance from **A** to **D**.

[3 marks]

Question 2d

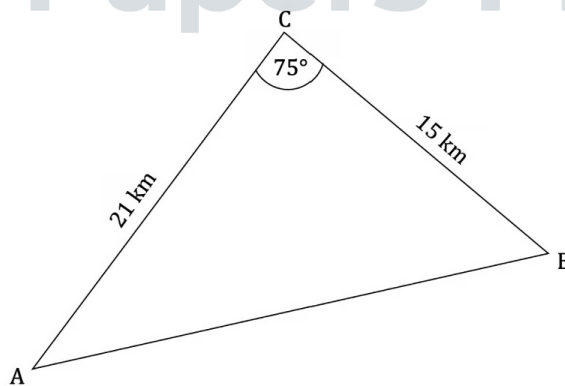
Calculate the bearing the support boat must follow to travel from A to D.

[4 marks]



Question 3a

The following diagram shows triangle ABC. $AC = 21$ km, $CB = 15$ km, $\widehat{ACB} = 75^\circ$.



Find the area of triangle ABC.

[2 marks]

Question 3b

Find \widehat{AB} .

[3 marks]

Question 3c

Given that it is acute, find \widehat{CAB} .

[2 marks]



Exam Papers Practice

Question 4a

Triangle ABC has an area of 122 cm^2 , $AB = 24 \text{ cm}$ and $BC = 11 \text{ cm}$.

Draw and label a diagram to show triangle and clearly mark the distances given.

[1 mark]

Question 4b

Given that \widehat{ABC} is acute, find

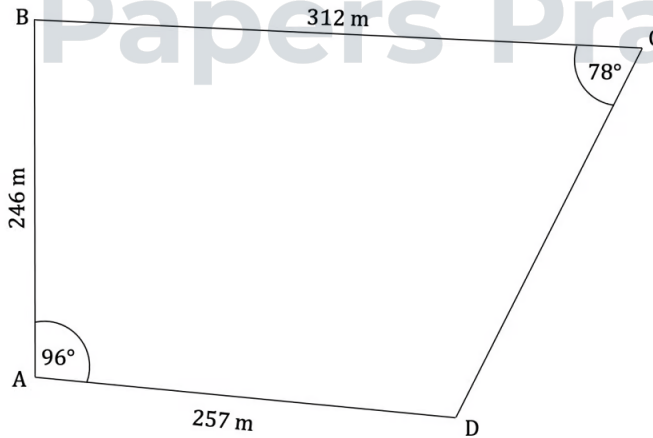
(i)
 \widehat{ABC}

(ii)
AC.

[4 marks]

Question 5a

The quadrilateral ABCD shown below represents a farm paddock, where $AB = 246$ m, $BC = 312$ m and $AD = 257$ m. Angle $\widehat{DAB} = 96^\circ$ and angle $\widehat{BCD} = 78^\circ$.



A fence is built connecting points B and D to split the paddock into two.

Find the length of the fence.

[3 marks]

Question 5b

Find the area of the paddock ABCD.

[5 marks]



Exam Papers Practice

Question 6a

A 38 m high cliff is perpendicular to the sea and the angle of depression from the cliff to a boat at sea is 24° . Climbing the cliff is a rock climber and the angle of elevation from the boat to the climber 14° .

Draw and label a diagram to show the top of the cliff, T, the foot of the cliff, F, the climber, C, the boat, B, labelling all the angles and distances given above.

[2 marks]

Question 6b

Find the distance from the boat to the foot of the cliff.

[2 marks]

Question 6c

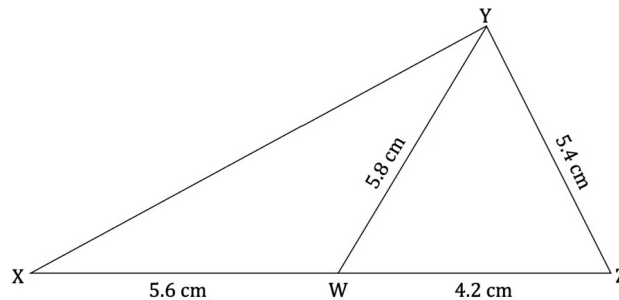
Find how far the climber must climb to reach the top of the cliff.

[4 marks]



Question 7a

The diagram below shows triangle XYZ with side length $YZ = 5.4$ cm. The point W is placed such that $XW = 5.6$ cm and $WZ = 4.2$ cm and $YW = 5.8$ cm.



Find the angle \widehat{YZW} .

[2 marks]

Question 7b

Find the area of triangle XYZ.

[2 marks]

Question 7c

Find the area of triangle XYW.

[3 marks]



Exam Papers Practice

Question 8a

The distance between towns X and Y is 134.2 km. The bearing of town X from town Y is 119° . Town Z is 54 km south of town X. The bearing of town Z from town X is 207° .

Draw and label a diagram to show towns X, Y and Z, clearly marking the bearings and distances given above.

[2 marks]

Question 8b

Calculate the distance between towns X and Z.

[2 marks]

Question 8c

Calculate the distance between towns Y and Z.

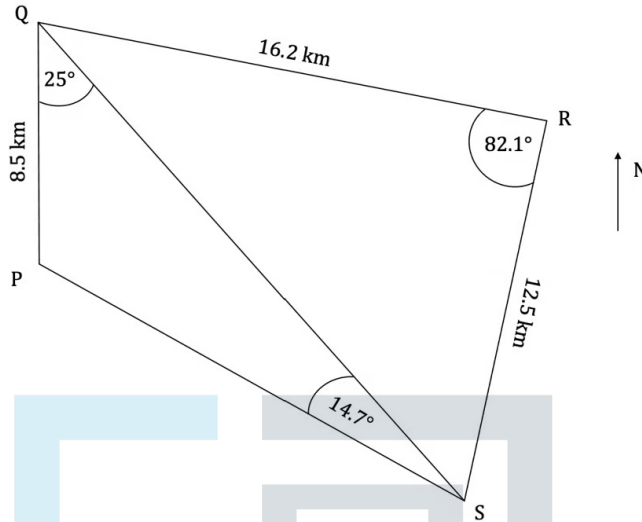
[4 marks]



Exam Papers Practice

Question 9

The diagram below shows four Islands P, Q, R and S. $PQ = 8.5$ km, $QR = 16.2$ km and $RS = 12.5$ km. Angle $\widehat{PQS} = 25^\circ$, angle $\widehat{QSP} = 14.7^\circ$ and angle $\widehat{QRS} = 82.1^\circ$. Island Q is due north from Island P.



Mark is making deliveries around the Islands. He takes milk from Island Q to Island S, then takes wood from Island S to Island P, finally he delivers fruit from Island P to Island R.

Find the total distance Mark travels.

[8 marks]

Question 10a

Nathan (N) stands 10 m above the ground on the second-floor balcony of an apartment building and can see Melissa (M) in the car park. The angle of elevation from Melissa to Nathan is 21.6° .

Calculate the distance from M to N.

[2 marks]

Question 10b

Louisa (L) is standing on the other side of the car park. The distance between Louisa and Nathan is 1.5 times the distance between Melissa and Nathan.

Calculate the angle of depression from N to L.

[3 marks]

Exam Papers Practice