



# Trigonometry 1 Questions

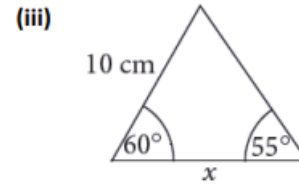
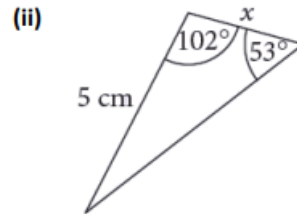
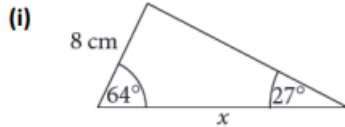
## Exercises:

### Q1

If  $\tan B = \frac{\sqrt{5}}{2}$ , find the values of  $\sin B$  and  $\cos B$ .

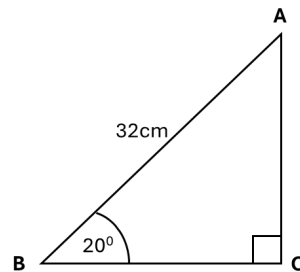
### Q2

Find the side  $x$  in each of the following triangles:



### Q3

Find the missing sides and angle in the following triangle:

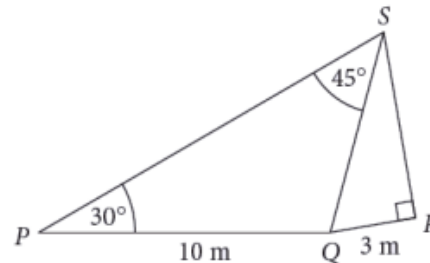


### Q4

The diagram shows two triangles  $PQS$  and  $QRS$ .

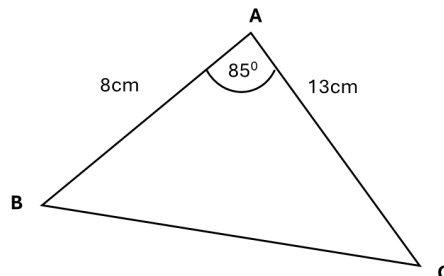
Find, in surd form:

- (i)  $|SQ|$
- (ii)  $|SR|$
- (iii)  $|PS|$



### Q5

Find the missing side and angles in the following triangle (correct to 2 decimal places):

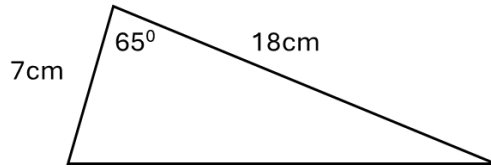


### Q6

Find the area of the below triangle:



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**Q7**

The area of an equilateral triangle is  $9\sqrt{3}\text{m}^2$ . Find the length of the side of the triangle.

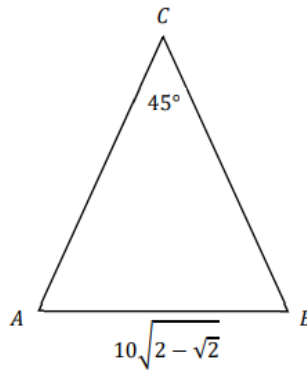
**Q8**

- (i) Express  $\frac{\pi}{5}$  radians in degrees.
- (ii) Express  $210^\circ$  in radians.

## Exam Questions:

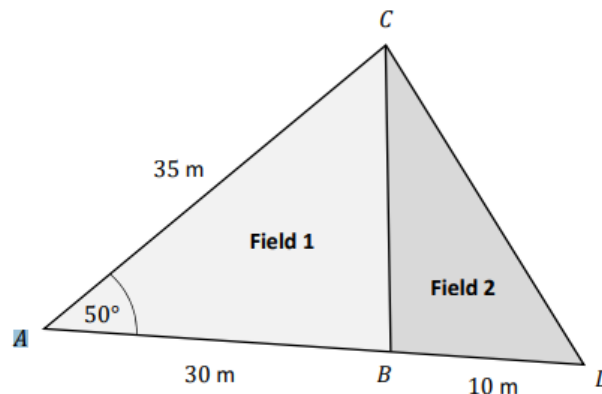
### Q1 - 2022 Paper 2 Question 4b

- (b) The triangle  $ABC$  is shown in the diagram below.  
 $|AC| = |BC|$  and  $|\angle ACB| = 45^\circ$ .  $|AB| = 10\sqrt{2 - \sqrt{2}}$ , as shown.  
 Find the length  $|AC|$ .



### Q2 - 2022 Paper 2 Question 9

$B$  lies on the line  $AD$ .  $|AB| = 30\text{ m}$ ,  $|BD| = 10\text{ m}$ ,  $|AC| = 35\text{ m}$ , and  $|\angle CAD| = 50^\circ$ .  
 Note: the angle  $ABC$  is **not** a right angle.



- (a) Find the area of **Field 1** and, hence, find the area of **Field 2**.  
 Give each answer correct to the nearest  $\text{m}^2$ .

# Trigonometry 1 Questions

- (b) Find the length of the perimeter of **Field 1**.  
Give your answer correct to the nearest metre.

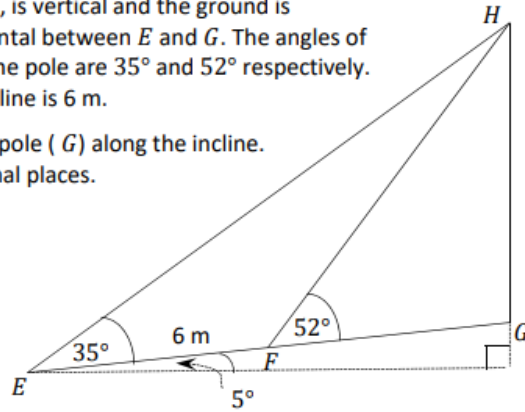
## Q3 – 2020 Paper 2 Question 3

### Question 3

(25 marks)

- (a) A flagpole  $[GH]$ , shown in the diagram, is vertical and the ground is inclined at an angle of  $5^\circ$  to the horizontal between  $E$  and  $G$ . The angles of elevation from  $E$  and  $F$  to the top of the pole are  $35^\circ$  and  $52^\circ$  respectively. The distance from  $E$  to  $F$  along the incline is 6 m.

Find how far  $F$  is from the base of the pole ( $G$ ) along the incline.  
Give your answer correct to two decimal places.

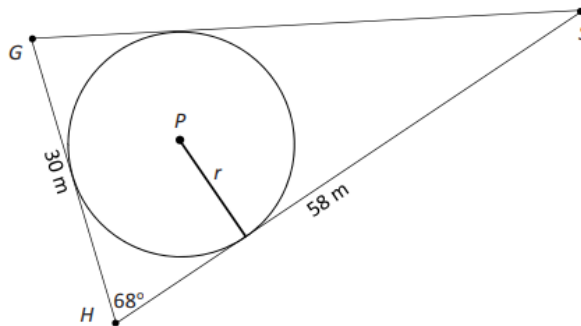


## Q4 – 2019 Paper 2 Question 9

### Question 9

(55 marks)

The diagram below shows a triangular patch of ground  $\triangle SGH$ , with  $|SH| = 58$  m,  $|GH| = 30$  m, and  $\angle GHS = 68^\circ$ . The circle is a helicopter pad. It is the incircle of  $\triangle SGH$  and has centre  $P$ .



- (a) Find  $|SG|$ . Give your answer in metres, correct to 1 decimal place.
- (b) Find  $\angle HSG$ . Give your answer in degrees, correct to 2 decimal places.
- (c) Find the area of  $\triangle SGH$ . Give your answer in  $\text{m}^2$ , correct to 2 decimal places.

## Q5 - 2023 Paper 2 Question 7b

# Trigonometry 1 Questions

- (b) Olga wants to measure the vertical height of a hill. The point  $H$  is at the top of the hill. The points  $R$  and  $P$  are 20 m apart on horizontal ground, at the bottom of the hill.

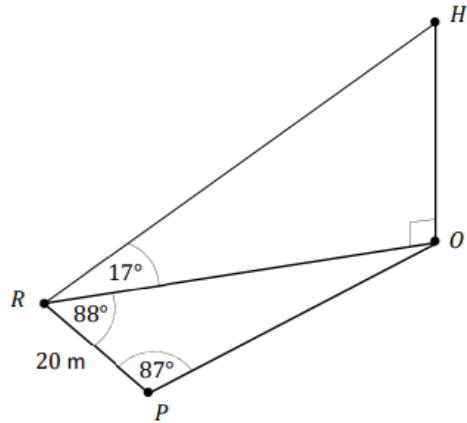
Olga measures the angle of elevation from  $R$  to  $H$ .

Taking  $O$  to be the point directly below  $H$  that is horizontal with  $R$  and  $P$ , Olga also measures the angles  $\angle OPR$  and  $\angle ORP$ .

All of these are shown in the diagram below (not to scale).



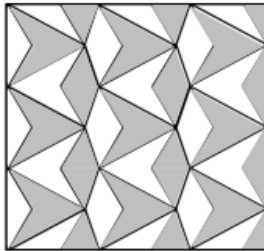
Source: [www.bikeforums.net/road-cycling](http://www.bikeforums.net/road-cycling)



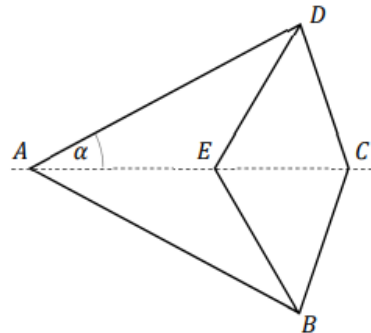
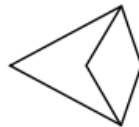
Work out the distance  $|OH|$ , the vertical height of the top of the hill relative to the points  $R$  and  $P$ . Give your answer correct to the nearest metre.

## Q6 - 2023 Paper 2 Question 9b

- (b) Next, Ava looks at more complicated tilings. The tiling below is made up of two shapes: an arrowhead ( $ABED$ ) and a quadrilateral ( $EBCD$ ). The point  $E$  lies on the line  $AC$ , and both shapes are **symmetrical** about  $AC$  (diagrams not to scale).



Tiling



- (i)  $|AD| = 8$  cm,  $|AE| = 6$  cm, and  $|ED| = 4$  cm.

As shown in the diagram,  $\alpha = \angle DAE$ . Show that  $\alpha = \cos^{-1}\left(\frac{7}{8}\right)$ .

- (ii) In the diagram  $|\angle ADC| = |\angle ABC| = 90^\circ$ .

Use this, and part (b)(i), to work out the total area of the quadrilateral  $ABCD$ , correct to 2 decimal places.