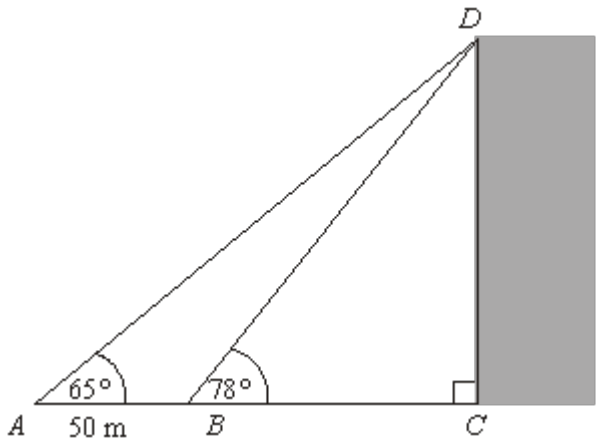
Q1.

Diagram **NOT** accuartely drawn



Steve is working out the height of a tall vertical building *CD*.
The building is standing on horizontal ground.

Steve measures the angle of elevation of the top, *D*, of the building from two different points *A* and *B*.

The angle of elevation of *D* from *A* is 65°.
The angle of elevation of *D* from *B* is 78°.
AB = 50 m.
ABC is a straight line.

Calculate the height of the building.
Give your answer correct to 3 significant figures.

..... m

(Total 6 marks)

Q2.

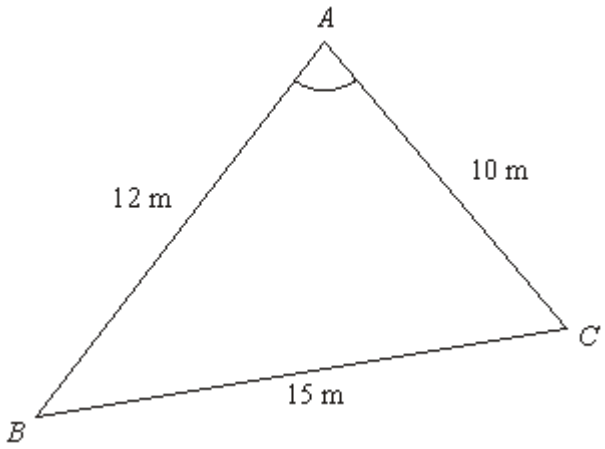


Diagram **NOT** accurately drawn

ABC is a triangle.
AB = 12 m.
AC = 10 m.
BC = 15 m.

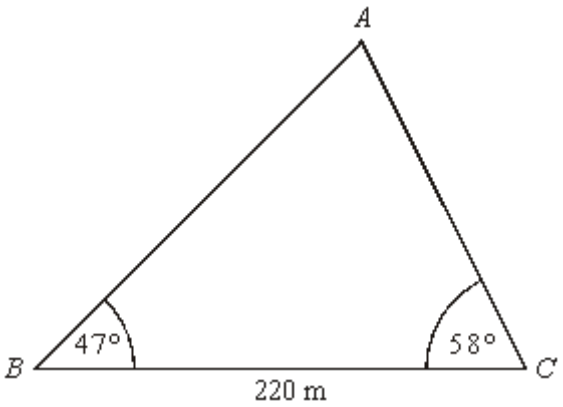
Calculate the size of angle BAC.
Give your answer correct to one decimal place.

.....°

(Total 3 marks)

Q3.

Diagram **NOT** accurately drawn



Angle *ABC* = 47°
Angle *ACB* = 58°
BC = 220 m

Calculate the area of triangle *ABC*.
Give your answer correct to 3 significant figures.

.....

(Total 5 marks)

M1.

Working	Answer	Mark	Additional Guidance
78 – 65 = 13 $\frac{DB}{\sin 65} = \frac{50}{\sin "13"}$ $DB = \frac{50}{\sin "13"} \times \sin 65$ (=201..) "201" × sin 78	197 m	6	**B1** for 13°

	Total for Question: 6 marks

M2.

Working	Answer	Mark	Additional Guidance
$\cos x = \frac{12^2 + 10^2 - 15^2}{2 \times 12 \times 10} = \frac{19}{240}$ $x = \cos^{-1} 0.079 = 85.459\ldots$ **OR** $15^2 = 12^2 + 10^2 - 2 \times 12 \times 10 \times \cos x$ $\cos x = \frac{15^2 - 12^2 - 10^2}{-2 \times 12 \times 10}$ $= \frac{12^2 + 10^2 - 15^2}{2 \times 12 \times 10} = \frac{19}{240}$ $x = \cos^{-1} 0.079 = 85.459\ldots$	85.5	3	**M2** $\cos A = \frac{12^2 + 10^2 - 15^2}{2 \times 12 \times 10}$ **A1** 85.4-85.5 **OR** **M1** correct substitution into $a^2 = b^2 + c^2 - 2bc \cos A$ **M1** correct rearrangement of $a^2 = b^2 + c^2 - 2bc \cos A$ algebraically to $(\cos A) = \frac{b^2 + c^2 - a^2}{2 \times b \times c}$ oe or to $(\cos A =) \frac{12^2 + 10^2 - 15^2}{2 \times 12 \times 10}$ oe These can be earned in either order **A1** 85.4-85.5 SC **B2** Radians 1.49 seen **B2** Gradians 94.89-95 seen
			Total for Question: 3 marks

M3.

Working	Answer	Mark	Additional Guidance

Angle *BAC* = 180º — 47º — 58º = 75º $\frac{AC}{\sin 47} = \frac{220}{\sin 75} (= \frac{AB}{\sin 58})$ $AC = \frac{220 \sin 47}{\sin 75} = 166.57..$ Area = $\frac{1}{2}$ × 220 × '166.57' × sin58 = 15538	15500 m^2	5	**B1** for 75º

Total for Question: 5 marks

E2. Candidates who had put in some preparation were rewarded on this question by a task which involved a straight substitution and it was very telling that this approach yielded much more success than that of using the given formula at the front of the paper and then manipulating to isolate cos*A*. Of the candidates who did adopt this latter approach, many forgot about operator precedence and ended up with 225 = 4 cos*A* from which they concluded that A was 56.25 degrees.