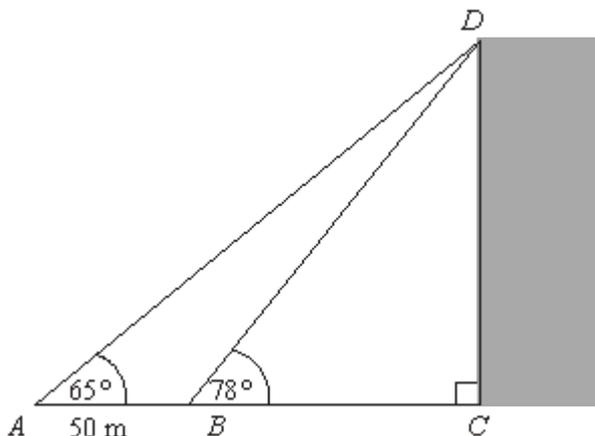


Q1.

Diagram **NOT**
accurately 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 .

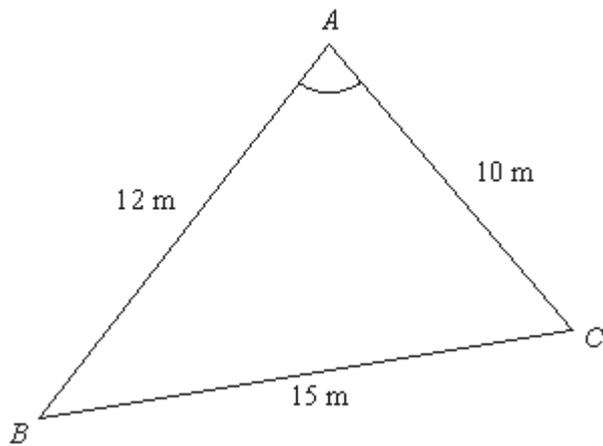
The angle of elevation of D from A is 65° .
The angle of elevation of D from B is 78° .
 $AB = 50$ m.
 ABC is a straight line.

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.

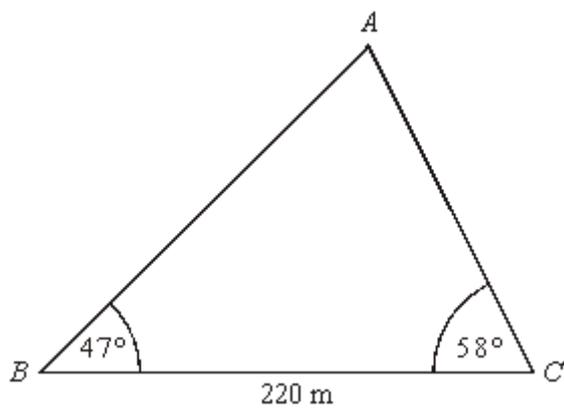
Calculate the size of angle BAC .

Give your answer correct to one decimal place.

.....°

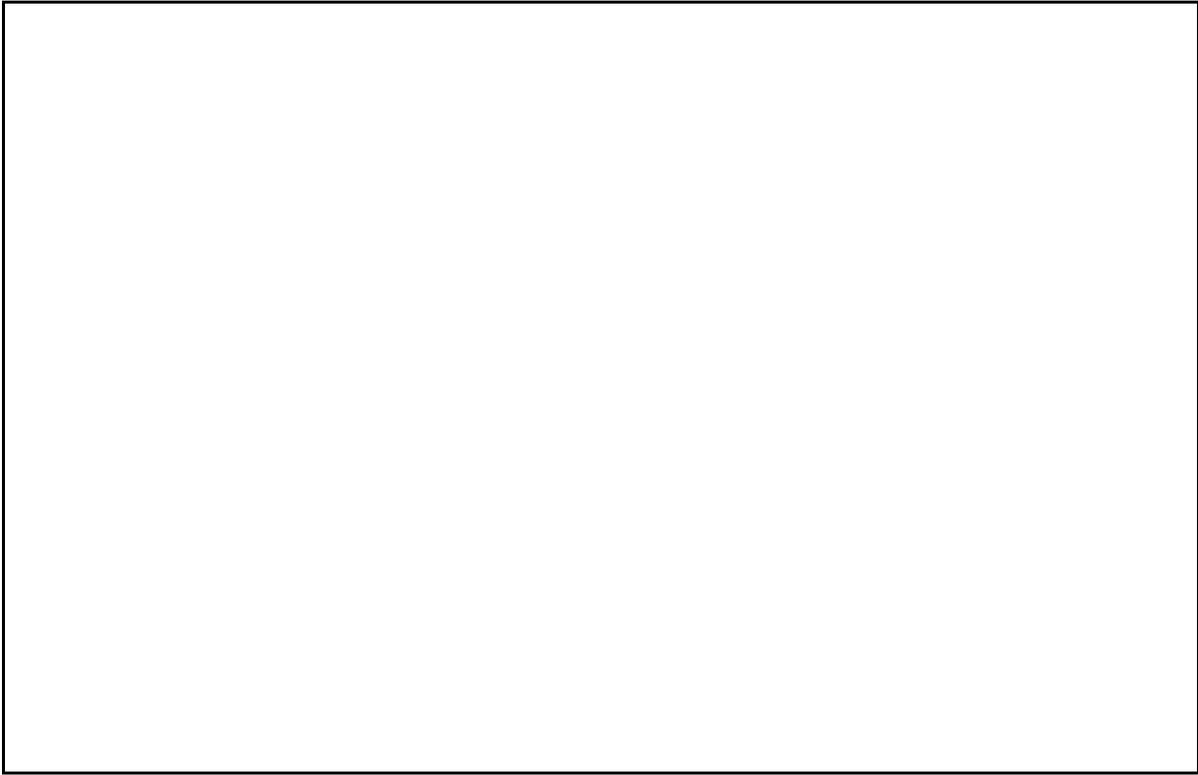
(Total 3 marks)

Q3.

Diagram **NOT**
accurately drawn

Angle $ABC = 47^\circ$
Angle $ACB = 58^\circ$
 $BC = 220 \text{ m}$

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" $\times \sin 78$	197 m	6	B1 for 13°

Total for Question: 6 marks

M2.

Working	Answer	Mark	Additional Guidance
$\cos x = \frac{12^2 + 10^2 - 15^2}{2 \times 12 \times 10} = \frac{19}{240}$ $x = \cos^{-1} 0.079 = 85.459\dots$ <p>OR</p> $15^2 = 12^2 + 10^2 - 2 \times 12 \times 10 \times \cos x$ $\cos x = \frac{15^2 - 12^2 - 10^2}{-2 \times 12 \times 10}$ $= \frac{12^2 + 10^2 - 15^2}{2 \times 12 \times 10} = \frac{19}{240}$ $x = \cos^{-1} 0.079 = 85.459\dots$	85.5	3	$\cos A = \frac{12^2 + 10^2 - 15^2}{2 \times 12 \times 10}$ <p>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</p>
			Total for Question: 3 marks

M3.

Working	Answer	Mark	Additional Guidance
---------	--------	------	---------------------

Angle $BAC = 180^\circ - 47^\circ - 58^\circ = 75^\circ$	15500 m ²	5	B1 for 75°
$\frac{AC}{\sin 47} = \frac{220}{\sin 75} \left(= \frac{AB}{\sin 58} \right)$			
$AC = \frac{220 \sin 47}{\sin 75} = 166.57..$			
$\text{Area} = \frac{1}{2} \times 220 \times '166.57' \times \sin 58$			
$= 15538$			

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.