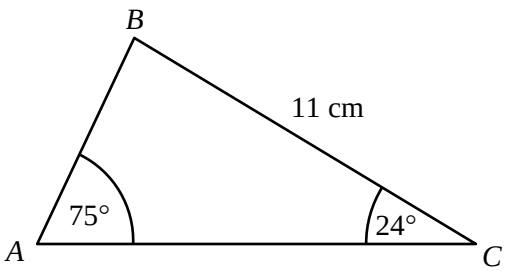
The Sine Rule

SCAN ME

REVISE THIS TOPIC

1 Here is triangle *ABC*.



Work out the length of *AB*.
Give your answer to 1 decimal place.

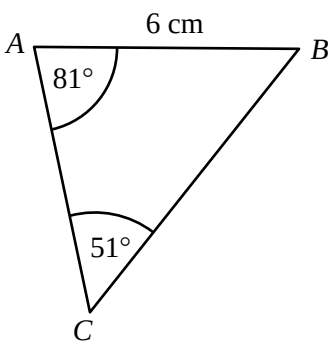
$$\frac{x}{\sin(24)} = \frac{11}{\sin(75)}$$

$$x = \frac{11\sin(24)}{\sin(75)}$$

4.6 ..... cm

(Total for Question 1 is 3 marks)

2 Here is triangle *ABC*.



Work out the length of *BC*.
Give your answer to 1 decimal place.

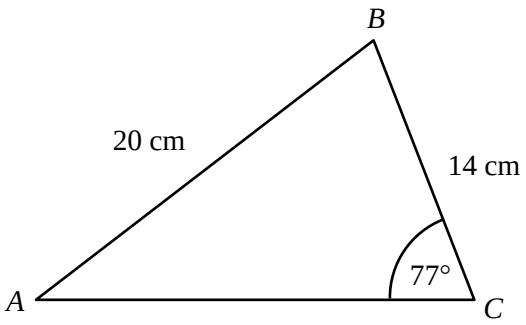
$$\frac{x}{\sin(81)} = \frac{6}{\sin(51)}$$

$$x = \frac{6\sin(81)}{\sin(51)}$$

7.6 ..... cm

(Total for Question 2 is 3 marks)

3 Here is triangle *ABC*.



Work out the size of angle *BAC*.
Give your answer to 1 decimal place.

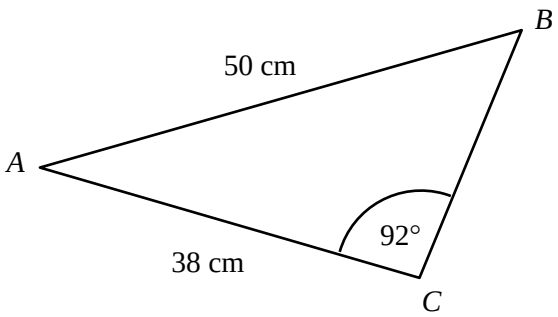
$\frac{\sin(x)}{14} = \frac{\sin(77)}{20}$ $\sin(x) = 0.68205...$

$\sin(x) = \frac{14\sin(77)}{20}$ $x = \sin^{-1}(0.6820...)$

43.0 °

(Total for Question 3 is 3 marks)

4 Here is triangle *ABC*.



Work out the size of angle *ABC*.
Give your answer to 1 decimal place.

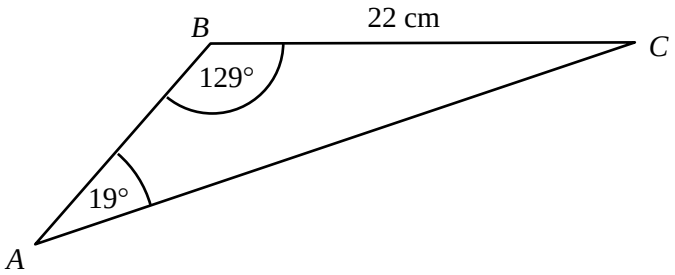
$\frac{\sin(x)}{38} = \frac{\sin(92)}{50}$ $\sin(x) = 0.75953...$

$\sin(x) = \frac{38\sin(92)}{50}$ $x = \sin^{-1}(0.75953...)$

49.4 °

(Total for Question 4 is 3 marks)

5 Here is triangle *ABC*.



Work out the length of *AC*.
Give your answer to 1 decimal place.

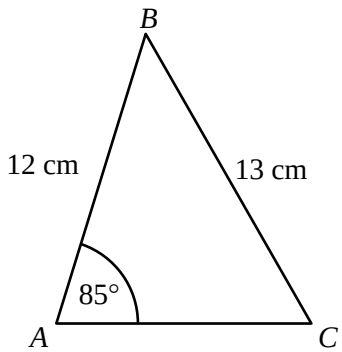
$$\frac{x}{\sin(129)} = \frac{22}{\sin(19)}$$

$$x = \frac{22\sin(129)}{\sin(19)}$$

52.5 cm

(Total for Question 5 is 3 marks)

6 Here is triangle *ABC*.



Work out the size of angle *BCA*.
Give your answer to 1 decimal place.

$$\frac{\sin(x)}{12} = \frac{\sin(85)}{13}$$

$$\sin(x) = \frac{12\sin(85)}{13}$$

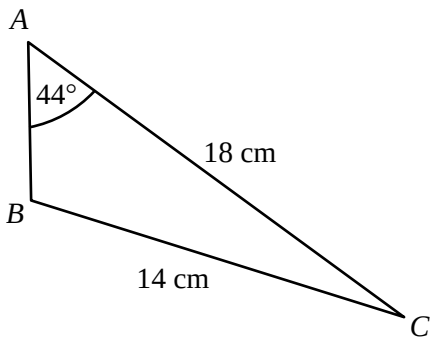
$$\sin(x) = 0.919564...$$

$$x = \sin^{-1}(0.91956...)$$

66.9 °

(Total for Question 6 is 3 marks)

7 Here is triangle *ABC*.



Work out the size of angle *ABC*.
Give your answer to 1 decimal place.

$\frac{\sin(x)}{18} = \frac{\sin(44)}{14}$

$\sin(x) = \frac{18\sin(44)}{14}$

$\sin(x) = 0.89313...$

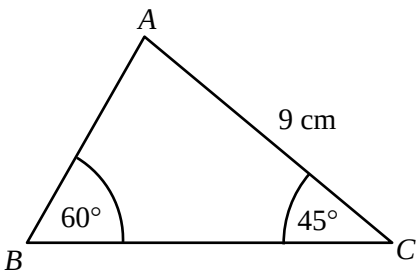
$x = \sin^{-1}(0.89313...)$

$x = 63.2695...$

x is obtuse so $180 - 63.2695...$ 116.7 °

(Total for Question 7 is 3 marks)

8 Here is triangle *ABC*.



Work out the length of *AB*.
Give your answer in the form $k\sqrt{6}$, where k is an integer.

$\frac{x}{\sin(45)} = \frac{9}{\sin(60)}$

$x = \frac{9\sin(45)}{\sin(60)}$

$x = \frac{9 \times \frac{\sqrt{2}}{2}}{\frac{\sqrt{3}}{2}}$

$x = \frac{9\sqrt{2}}{2} \times \frac{2}{\sqrt{3}}$

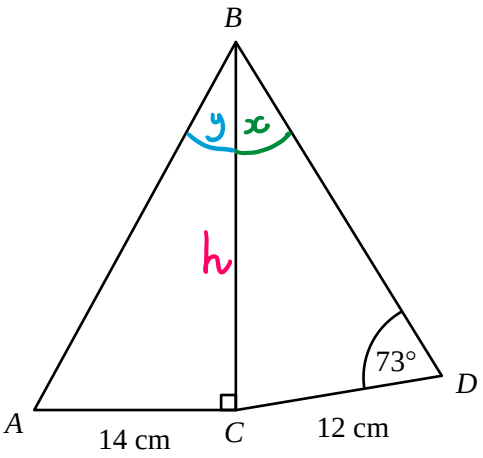
$x = \frac{9\sqrt{2}}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$

$x = \frac{9\sqrt{6}}{3}$

$3\sqrt{6}$ cm

(Total for Question 8 is 4 marks)

9 *ABC* and *BCD* are triangles.



The area of triangle *ABC* is 154 cm^2
Work out the size of angle *ABD*.

$\frac{1}{2} \times 14 \times h = 154$

$7h = 154$

$h = 22cm$

$\frac{\sin(x)}{12} = \frac{\sin(73)}{22}$

$\sin(x) = \frac{12\sin(73)}{22}$

$\sin(x) = 0.5216...$

$x = \sin^{-1}(0.5216...)$

$x = 31.441...$

$\tan(y) = \frac{14}{22}$

$y = \tan^{-1}\left(\frac{14}{22}\right)$

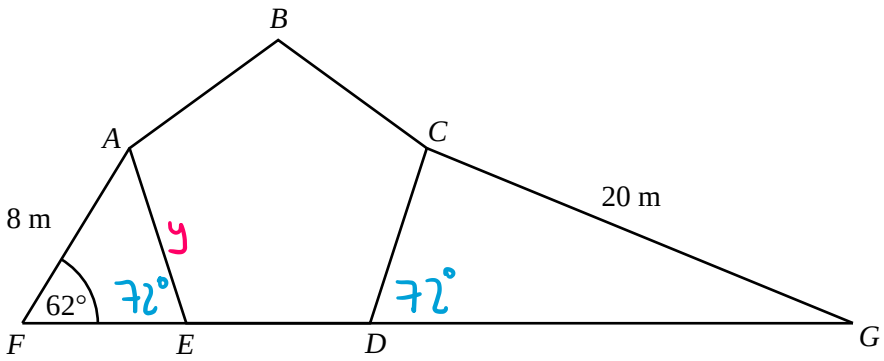
$y = 32.47...$

$31.441... + 32.47...$

63.9 °

(Total for Question 9 is 5 marks)

10 *ABCDE* is a regular pentagon
AEF and *CDG* are triangles.
FEDG is a straight line.



Work out the size of angle *CGD*.

angle AEF = angle CDG = $\frac{360}{5}$ = 72°

$\frac{y}{\sin(62)} = \frac{8}{\sin(72)}$ $\quad \frac{\sin(x)}{7.427...} = \frac{\sin(72)}{20}$

$y = \frac{8\sin(62)}{\sin(72)}$ $\quad \sin(x) = \frac{7.42...\sin(72)}{20}$

$y = 7.427...$ $\quad \sin(x) = 0.35317...$

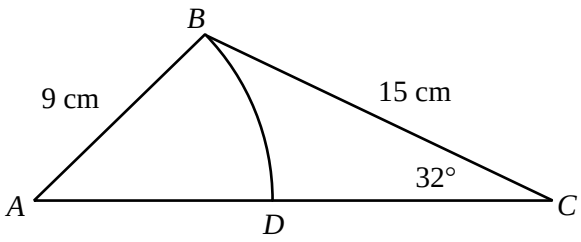
$x = \sin^{-1}(0.35317...)$

$x = 20.68188298$

20.7 °

(Total for Question 10 is 6 marks)

11 *ABC* is a triangle.
ABD is a sector with centre *A*.



Work out the area of sector *ABD*.

$$\frac{\sin(x)}{15} = \frac{\sin(32)}{9}$$

$$\sin(x) = \frac{15\sin(32)}{9}$$

$$\sin(x) = 0.8831\ldots$$

$$x = \sin^{-1}(0.8831\ldots)$$

$$x = 62.0306\ldots$$

$$\text{Area} = \frac{62.03\ldots}{360} \times \pi \times 9^2$$

$$= 43.8468971$$

43.8 ..... cm^2

(Total for Question 11 is 5 marks)