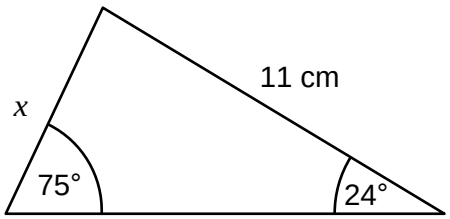
The Sine Rule

SCAN ME

REVISE THIS TOPIC

1 Work out the length of side x.



Not drawn accurately

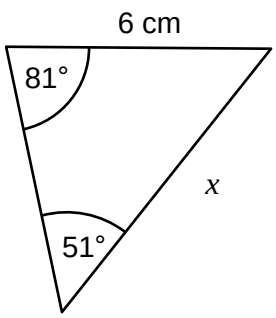
[3 marks]

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

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

$x =$ 4.6 cm

2 Work out the length of side x.



Not drawn accurately

[3 marks]

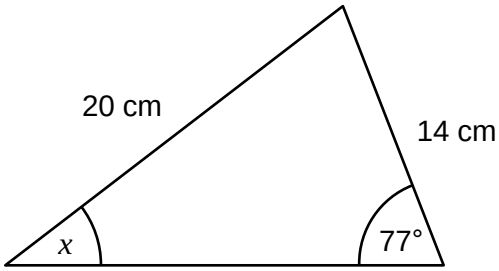
$$\frac{x}{\sin(81)} = \frac{6}{\sin(51)}$$

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

$x =$ 7.6 cm

6

3 Work out the size of angle x.



Not drawn accurately

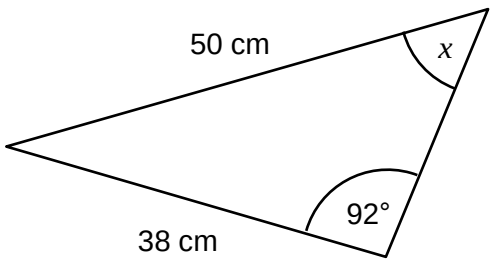
[3 marks]

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

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

$x =$ 43.0 °

4 Work out the size of angle x.



Not drawn accurately

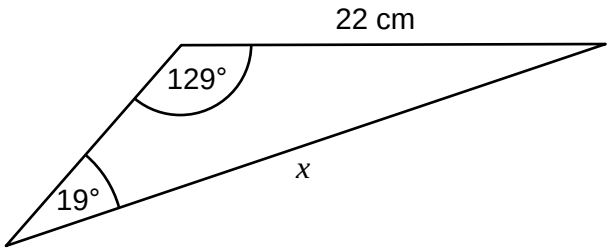
[3 marks]

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

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

$x =$ 49.4 °

5 Work out the length of side x.



Not drawn accurately

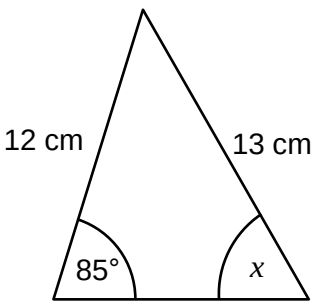
[3 marks]

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

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

$x =$ 52.5 cm

6 Work out the size of angle x.



Not drawn accurately

[3 marks]

$$\frac{\sin(x)}{12} = \frac{\sin(85)}{13} \qquad \sin(x) = 0.919564\ldots$$

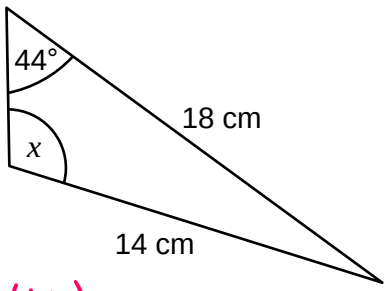
$$\sin(x) = \frac{12\sin(85)}{13} \qquad x = \sin^{-1}(0.91956\ldots)$$

$x =$ 66.9 °

12

Turn over ►

7 Given that angle x is obtuse, work out its size.



Not drawn accurately

[3 marks]

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

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

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

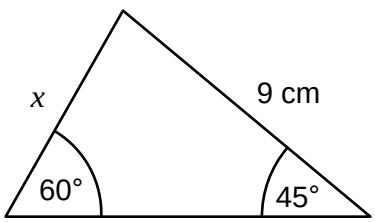
$x = \sin^{-1}(0.89313...)$

$x = 63.2695...$

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

$x =$ 116.7 °

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



Not drawn accurately

[4 marks]

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

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

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

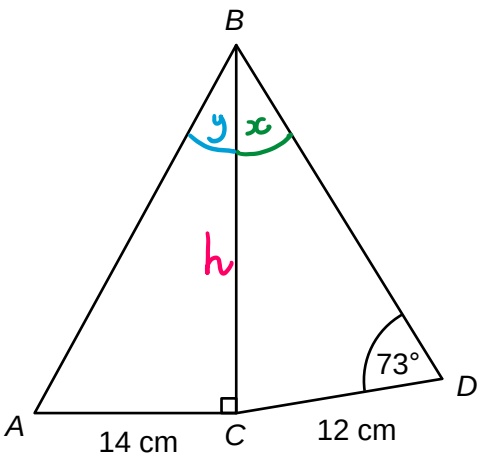
$x = \frac{9\sqrt{2}}{2} \times \frac{2}{\sqrt{3}}$

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

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

$x =$ $3\sqrt{6}$ cm

9 *ABC* and *BCD* are triangles.



Not drawn accurately

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

[5 marks]

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

$7h = 154$

$h = 22\text{cm}$

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

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

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

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

$\sin(x) = 0.5216\ldots$

$y = 32.47\ldots$

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

$x = 31.441\ldots$

$31.441\ldots + 32.47\ldots$

Answer 63.9 °

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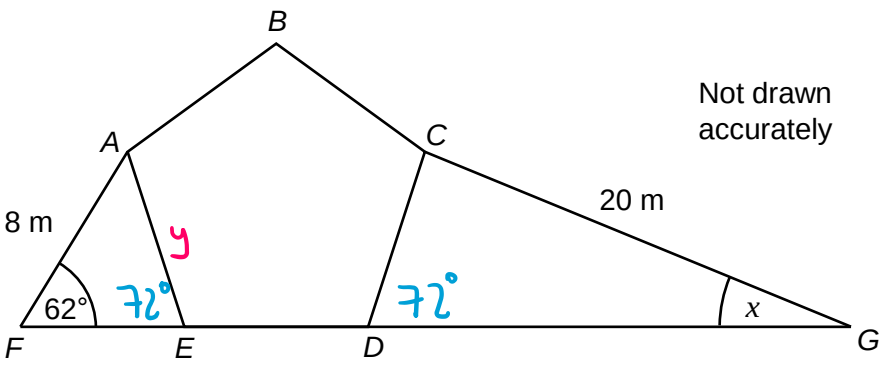
10 *ABCDE* is a regular pentagon
AEF and *CDG* are triangles.
FEDG is a straight line.



Work out the size of angle *x*. **[6 marks]**

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

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

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

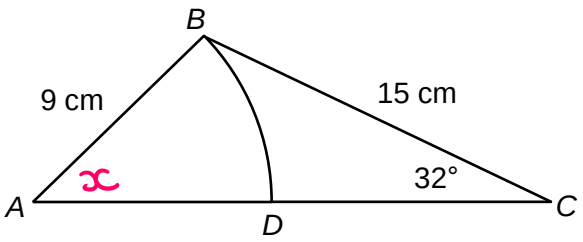
$y = 7.427...$ $\quad \sin(x) = 0.35317...$

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

$x = 20.68188298$

Answer 20.7 °

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



Not drawn accurately

Work out the area of sector *ABD*.

[5 marks]

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

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

$\sin(x) = 0.8831\ldots$

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

$x = 62.0306\ldots$

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

$= 43.8468971$

Answer 43.8 cm^2

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