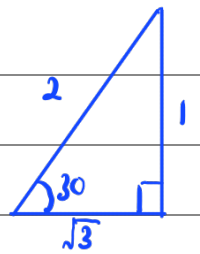
1 Show that the value of $5\sin 30° \times \cos 30° \times 8\tan 30°$ is an integer.

[4 marks]



$\sin 30° = \frac{1}{2}$

$\cos 30° = \frac{\sqrt{3}}{2}$ (1)

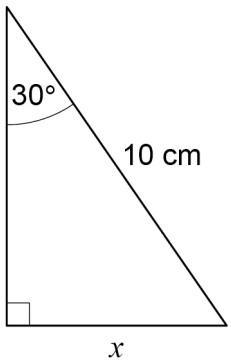
$\tan 30° = \frac{1}{\sqrt{3}}$ or $\frac{\sqrt{3}}{3}$

$5\left(\frac{1}{2}\right) \times \frac{\sqrt{3}}{2} \times 8\left(\frac{1}{\sqrt{3}}\right)$

$= \frac{5}{2} \times \frac{\sqrt{3}}{2} \times \frac{8\sqrt{3}}{3}$ (1)

$= \frac{40\sqrt{3}\sqrt{3}}{12} = \frac{40(3)}{12} = \frac{120}{12} = 10$ (1) (1)

2 Here is a right-angled triangle.



Not drawn accurately

Use trigonometry to work out the value of x.

[3 marks]

$\sin 30^\circ = \frac{x}{10}$ (1)

$x = 10 \sin 30^\circ$

$= 10\,(0.5)$ (1)

$= 5$ (1)

Answer 5 cm

3 Work out the value of $(\cos 30° \times \sin 45° \times \tan 60°)^2$

[4 marks]

$\cos 30° = \frac{\sqrt{3}}{2}$

$\sin 45° = \frac{\sqrt{2}}{2}$ (1)

$\tan 60° = \sqrt{3}$

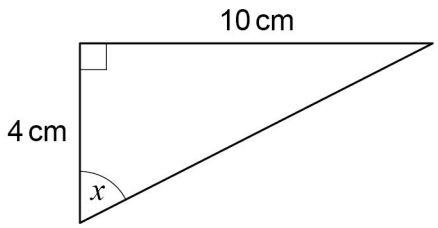
$= \left(\frac{\sqrt{3}}{2} \times \frac{\sqrt{2}}{2} \times \sqrt{3}\right)^2$ (1)

$= \left(\frac{\sqrt{18}}{4}\right)^2$ (1)

$= \frac{18}{16} = \frac{9}{8}$ (1)

Answer $\frac{9}{8}$

4 Use trigonometry to work out the size of angle x.



Not drawn accurately

[3 marks]

$\tan x^\circ = \frac{10}{4}$ (1) (1)

$x^\circ = \tan^{-1} 2.5$

$= 68.1$ (1)

$x =$ 68.1 °

5 Show that $\dfrac{4\sin 30^\circ - \tan 45^\circ}{2\cos 30^\circ}$ can be written as $\tan x$, where x is an acute angle.

[4 marks]

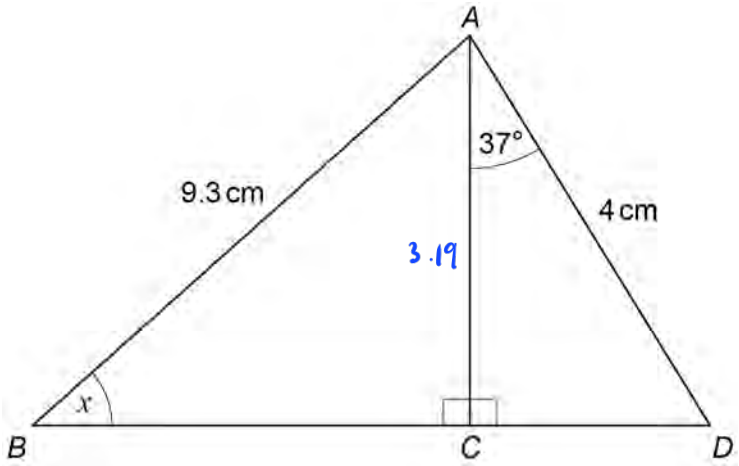
$\sin 30^\circ = \frac{1}{2}$, $\tan 45^\circ = 1$, $\cos 30^\circ = \frac{\sqrt{3}}{2}$ (1)

$\dfrac{4\left(\frac{1}{2}\right) - 1}{2\left(\frac{\sqrt{3}}{2}\right)} = \dfrac{2-1}{\sqrt{3}}$ (1)

$= \dfrac{1}{\sqrt{3}} = \tan 30^\circ$ (1)

$x = 30^\circ$

6



Not drawn accurately

Work out the size of angle x.

[4 marks]

$\cos 37^\circ = \frac{AC}{4}$ (1)

$AC = 4 \cos 37^\circ$

$= 3.19$ cm (1)

$\frac{\sin x}{3.19} = \frac{\sin 90^\circ}{9.3}$

$\sin x = \frac{1}{9.3} \times 3.19$

$x = \sin^{-1} 0.34$ (1)

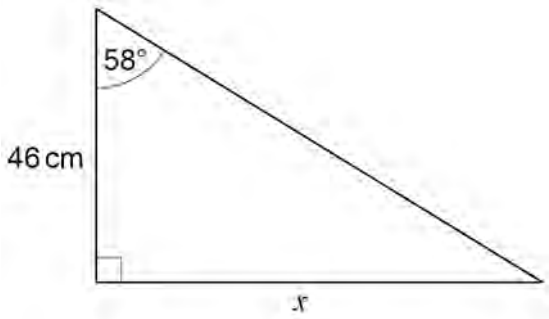
$= 19.87$

(1)

$x =$ 19.87 °

7 Use trigonometry to work out the value of x.

Not drawn accurately



[3 marks]

(1) $\tan 58^\circ = \frac{x}{46}$

$x = 46 \tan 58^\circ$ (1)

$= 73.6$ (1)

$x =$ 73.6 cm

8 $4 \times \sin 30° \times \tan 30° \times \cos 30° = \sin y$

Work out **one** possible value of y.

You **must** show your working.

[4 marks]

$\sin 30° = \frac{1}{2}$, $\tan 30° = \frac{\sqrt{3}}{3}$, $\cos 30° = \frac{\sqrt{3}}{2}$ (1)

$4 \times \frac{1}{2} \times \frac{\sqrt{3}}{3} \times \frac{\sqrt{3}}{2} = 1$ (1)

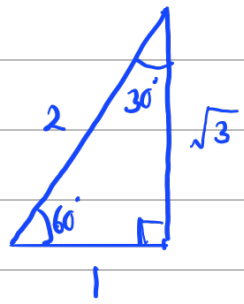
$\sin y = 1$ (1)

$y = 90°$ (1)

Answer 90 degrees

9 Show that the value of $6 \sin 30° + 2 \cos 30° \times 4 \tan 30°$ is an integer.

[4 marks]



$\sin 30° = \frac{1}{2}$

$\cos 30° = \frac{\sqrt{3}}{2}$ ✓1

$\tan 30° = \frac{1}{\sqrt{3}}$

$6\left(\frac{1}{2}\right) + \left(2\left(\frac{\sqrt{3}}{2}\right) \times 4\left(\frac{1}{\sqrt{3}}\right)\right)$ ✓1

$= 3 + \left(\sqrt{3} \times \frac{4}{\sqrt{3}}\right)$

$= 3 + 4$ ✓1

$= 7$ ✓1