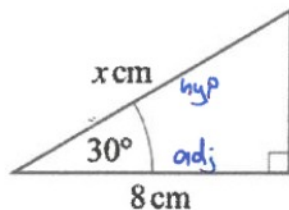


22



NOT TO  
SCALE

S<sup>o</sup><sub>H</sub> C<sup>A</sup><sub>H</sub> T<sup>o</sup><sub>A</sub>

Find the exact value of  $x$ .

$$\cos 30 = \frac{8}{x}$$

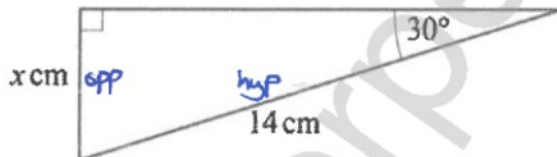
$$x \cos 30 = 8$$

$$x = \frac{8}{\cos 30}$$

$$x = \frac{8}{\frac{\sqrt{3}}{2}} = \frac{16}{\sqrt{3}}$$

$$x = \frac{16}{\sqrt{3}} \quad [4]$$

6



S<sup>o</sup><sub>H</sub> C<sup>A</sup><sub>H</sub> T<sup>o</sup><sub>A</sub>

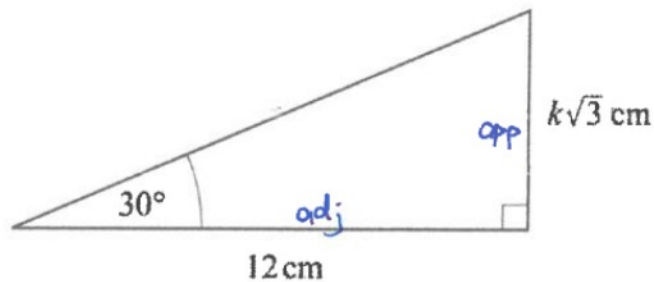
Work out the value of  $x$ .

$$\sin 30 = \frac{x}{14}$$

$$14 \sin 30 = x$$

$$x = 14 \times \frac{1}{2} = 7$$

$$x = 7 \quad [3]$$

NOT TO  
SCALES°H C°H T°AFind the value of  $k$ .

$$\tan 30 = \frac{k\sqrt{3}}{12}$$

$$\frac{\sqrt{3}}{3} \times \frac{k\sqrt{3}}{12}$$

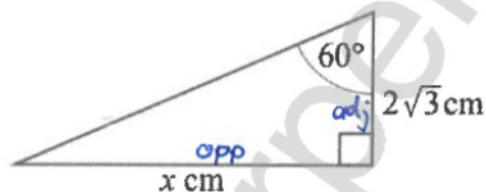
$$12\sqrt{3} = 3\sqrt{3}k$$

$\div 3\sqrt{3}$        $\div 3\sqrt{3}$

$$k = \frac{12\sqrt{3}}{3\sqrt{3}}$$

$$= 4$$

$$k = \dots\dots\dots 4 \dots\dots\dots [3]$$

S°H C°H T°AFind the value of  $x$ .

$$\tan 60 = \frac{x}{2\sqrt{3}}$$

$\times 2\sqrt{3}$        $\times 2\sqrt{3}$

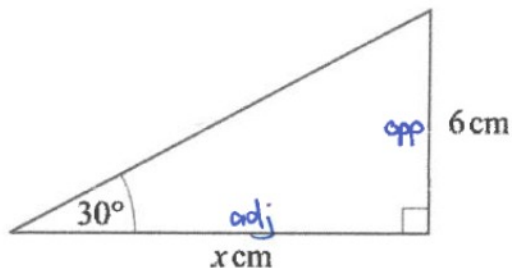
$$2\sqrt{3} \times \tan 60 = x$$

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

$$= 2 \times 3$$

$$= 6$$

$$x = \dots\dots\dots 6 \dots\dots\dots [3]$$

NOT TO  
SCALES°H C°H T°AFind the exact value of  $x$ .

$$\tan 30 = \frac{6}{x}$$

$$x \tan 30 = 6$$

$$x = \frac{6}{\tan 30}$$

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

$$= \frac{18}{\sqrt{3}}$$

$$x = \frac{18}{\sqrt{3}} \quad [4]$$

22 (a) Write down the exact value of  $\tan 60^\circ$ . $\sqrt{3}$ 

..... [1]

(b) Solve  $2 \sin x - 1 = 0$  for  $0^\circ \leq x \leq 360^\circ$ .

$$2 \sin x - 1 = 0$$

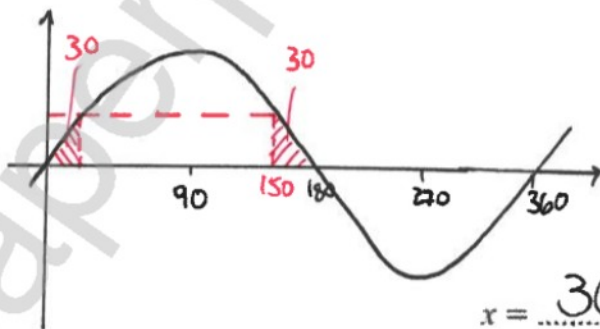
$$2 \sin x = 1$$

$$\sin x = \frac{1}{2}$$

$$\sin 30 = \frac{1}{2}$$

$$\text{so } x = 30^\circ$$

$$\text{use graph} \rightarrow 180 - 30 = 150^\circ$$



$$x = 30^\circ \text{ or } x = 150^\circ \quad [3]$$

24  $\tan x = \sqrt{3}$  and  $0^\circ \leq x \leq 360^\circ$ .

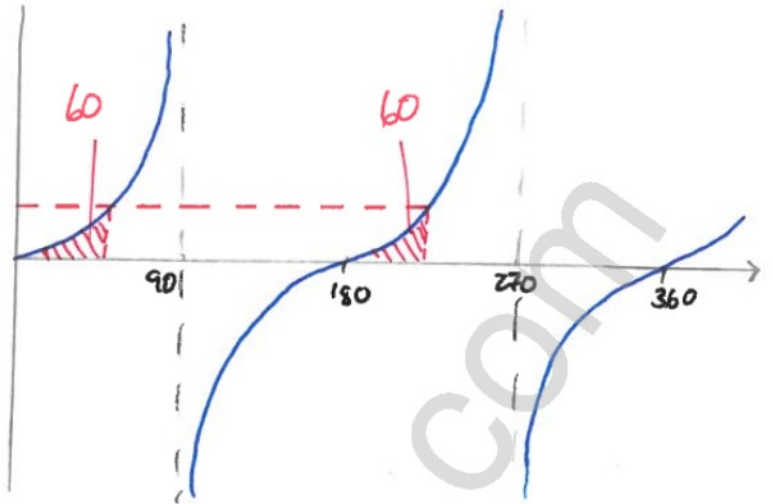
Find all the possible values of  $x$ .

$$\tan 60 = \sqrt{3}$$

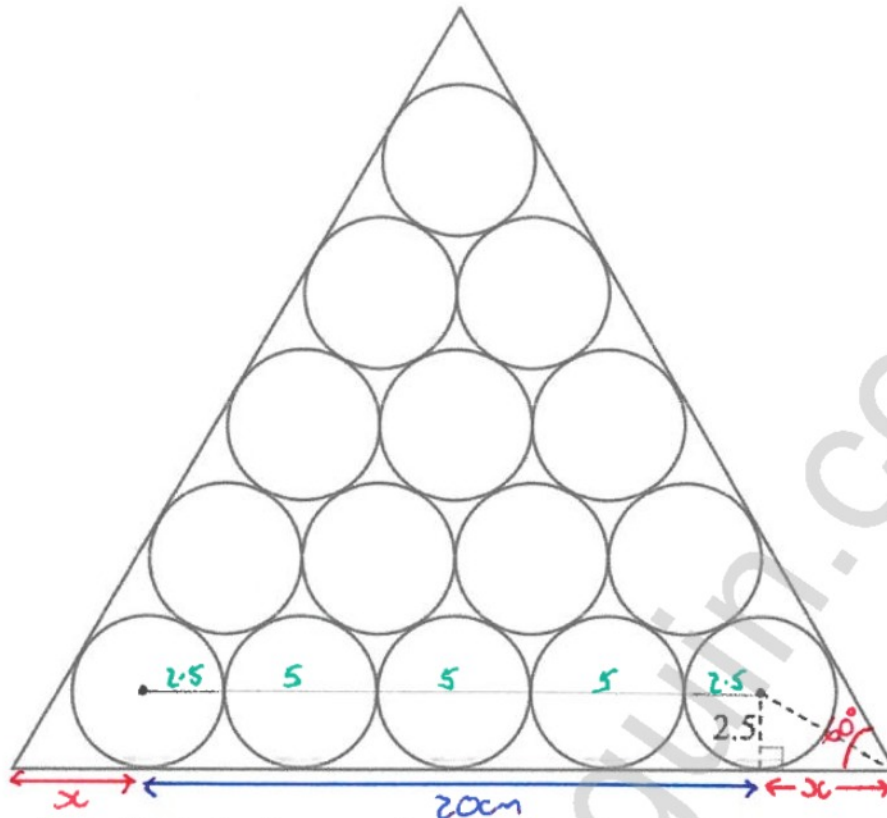
$$\text{so } x = 60^\circ$$

use graph:

$$180 + 60 = \underline{240^\circ}$$



$$\underline{x = 60^\circ, 240^\circ}$$

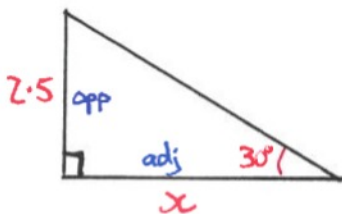


NOT TO  
SCALE

The diagram shows 15 circles in an equilateral triangle.  
The circles touch each other and the triangle.  
The radius of each circle is 2.5 cm.

The length of each side of the triangle is  $(a + b\sqrt{3})$  cm where  $a$  and  $b$  are integers.

Find the value of  $a$  and the value of  $b$ .



$S^{\circ} H C^{\circ} H T^{\circ} A$

$$\tan 30 = \frac{2.5}{x}$$

$$x \tan 30 = 2.5$$

$$x = \frac{2.5}{\tan 30}$$

$$= \frac{2.5 \times 3}{\sqrt{3}}$$

$$= \frac{7.5}{\sqrt{3}}$$

One side of triangle:

$$20 + 2x$$

$$= 20 + 2 \times \frac{7.5}{\sqrt{3}}$$

$$= 20 + \frac{15}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$$

$$= 20 + \frac{15\sqrt{3}}{3}$$

$$= 20 + 5\sqrt{3}$$

$$\underline{\underline{a = 20}}$$

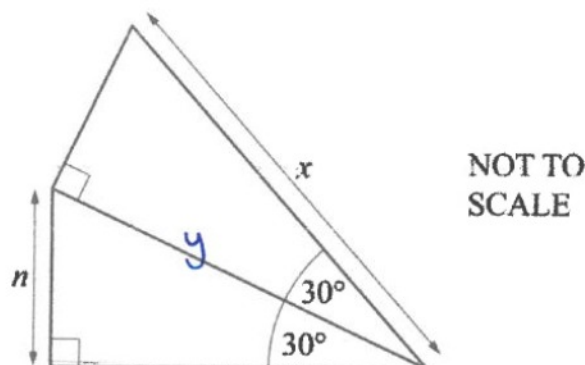
$$\underline{\underline{b = 5}}$$

[5]

- 23 (a) Write down the value of  $\cos 90^\circ$ .

..... [1]

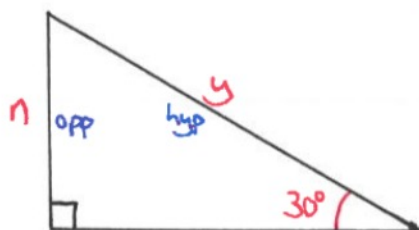
(b)



The diagram shows two different right-angled triangles joined by a common side.

Find  $x$  in terms of  $n$ .

S<sup>o</sup>H C<sup>A</sup>T<sup>o</sup>A



$$\sin 30 = \frac{n}{y}$$

$$y \sin 30 = n$$

$$y = \frac{n}{\sin 30}$$

$$y = \frac{n \times 2}{\frac{1}{2} \times 2}$$

$$y = 2n$$

S<sup>o</sup>H C<sup>A</sup>T<sup>o</sup>A

$$\cos 30 = \frac{2n}{x}$$

$$x \cos 30 = 2n$$

$$x \cos 30 = 2n$$

$$\div \cos 30 \quad \div \cos 30$$

$$x = \frac{2n}{\cos 30}$$

$$= \frac{2n \times 2}{\frac{\sqrt{3}}{2} \times 2}$$

$$= \frac{4n}{\sqrt{3}}$$

$$\frac{4n}{\sqrt{3}}$$

$$x = \frac{4n}{\sqrt{3}} \quad [5]$$