

**EXACT SIN/COS/TAN VALUES - PRACTICE QUESTIONS  
NON-CALCULATOR**



1.

(a) Write down the value of  $\cos(0)$ .

1

(b) Write down the value of  $\sin(90)$ .

1

(c) Write down the value of  $\cos(90)$ .

0

(d) Write down the value of  $\sin(0)$ .

0

(e) Write down the value of  $\cos(45)$ .

$\frac{\sqrt{2}}{2}$

(f) Write down the value of  $\tan(30)$ .

$\frac{\sqrt{3}}{3}$

(g) Write down the value of  $\sin(60)$ .

$\frac{\sqrt{3}}{2}$

(h) Write down the value of  $\sin(45)$ .

$\frac{\sqrt{2}}{2}$

(i) Write down the value of  $\cos(60)$ .

$\frac{1}{2}$

(j) Write down the value of  $\tan(45)$ .

1

(k) Write down the value of  $\tan(60)$ .

$\sqrt{3}$

(l) Write down the value of  $\sin(30)$ .

$\frac{1}{2}$

(m) Write down the value of  $\cos(30)$ .

$\frac{\sqrt{3}}{2}$

(n) Write down the value of  $\tan(0)$ .

0

2.

(a)  $\sin(x) = 1$  and  $0 \leq x \leq 90$ .

Find x.

90

(b)  $\cos(y) = \frac{1}{2}$  and  $0 \leq y \leq 90$ .

Find y.

60

(c)  $\sin(z) = \frac{\sqrt{2}}{2}$  and  $0 \leq z \leq 90$ .

Find z.

45

(d)  $\cos(a) = 0$  and  $0 \leq a \leq 90$ .

Find a.

90

(e)  $\sin(b) = \frac{\sqrt{3}}{2}$  and  $0 \leq b \leq 90$ .

Find b.

60

(f)  $\tan(c) = \frac{\sqrt{3}}{3}$  and  $0 \leq c \leq 90$ .

Find c.

30

(g)  $\cos(d) = \frac{\sqrt{2}}{2}$  and  $0 \leq d \leq 90$ .

Find d.

45

(h)  $\tan(e) = \sqrt{3}$  and  $0 \leq e \leq 90$ .

Find e.

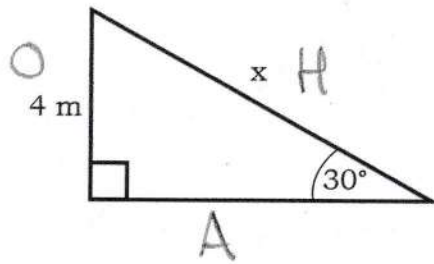
60

(i)  $\sin(f) = \frac{1}{2}$  and  $0 \leq f \leq 90$ .

Find f.

30

3.  
Find x.

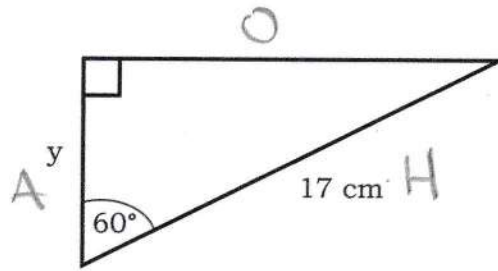


S O H

$$x = \frac{4}{\sin(30)}$$

$$= \frac{4}{\frac{1}{2}} = \underline{8 \text{ m}}$$

4.  
Find y.



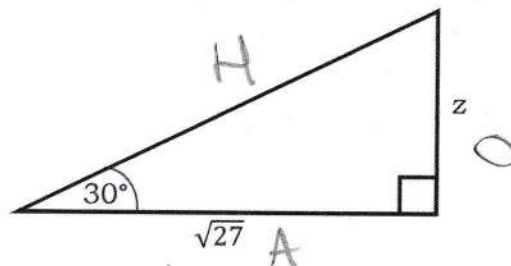
C A H

$$y = \cos(60) \times 17$$

$$= \frac{1}{2} \times 17$$

$$= \frac{17}{2} = \underline{8.5 \text{ cm}}$$

5.  
Find z.



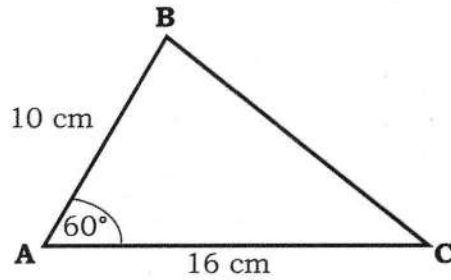
T O A

$$z = \tan(30) \times \sqrt{27}$$

$$= \frac{\sqrt{3}}{3} \times \sqrt{27} = \frac{\sqrt{81}}{3} = \frac{9}{3} = \textcircled{3}$$

6.

Find the area of ABC. Give your answer in the form  $a\sqrt{b}$  where a and b are integers.



$$\begin{aligned}\text{area} &= \frac{1}{2} \times 10 \times 16 \times \sin(60) \\ &= 80 \times \frac{\sqrt{3}}{2} = \underline{40\sqrt{3} \text{ cm}^2}\end{aligned}$$

7.

Show that

$$\tan(60) \times \sin(30) = \cos(30)$$

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

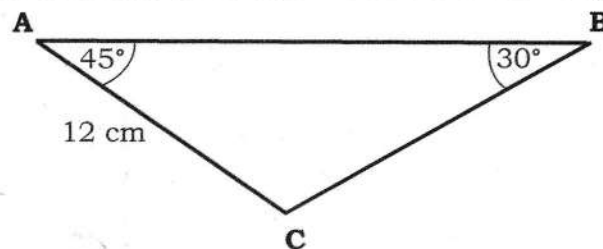
$$\sin(30) = \frac{1}{2}$$

$$\cos(30) = \frac{\sqrt{3}}{2}$$

$$\sqrt{3} \times \frac{1}{2} = \frac{\sqrt{3}}{2}$$

8.

Find BC. Give your answer in the form  $a\sqrt{2}$  where a is an integer.



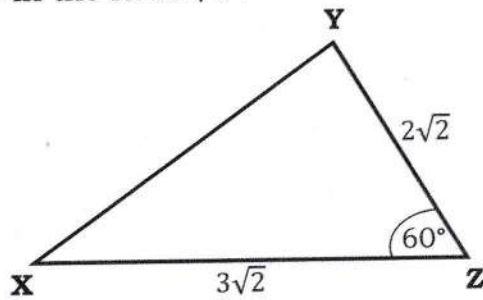
$$\frac{BC}{\sin(45)} = \frac{12}{\sin(30)}$$

$$\frac{BC}{\frac{\sqrt{2}}{2}} = \frac{12}{\frac{1}{2}}$$

$$BC = 24 \times \frac{\sqrt{2}}{2} = \underline{12\sqrt{2}}$$

9.

Find XY. Give your answer in the form  $\sqrt{a}$ .



$$\begin{aligned} XY^2 &= (2\sqrt{2})^2 + (3\sqrt{2})^2 - 2 \times 2\sqrt{2} \times 3\sqrt{2} \times \cos(60) \\ &= 8 + 18 - 24 \times \frac{1}{2} \\ &= 26 - 12 \\ &= 14 \\ XY &= \underline{\underline{\sqrt{14}}} \end{aligned}$$

10.

Express

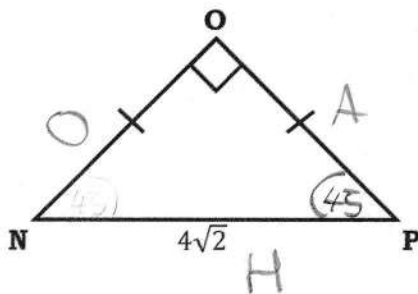
$$\frac{\cos(30) + \tan(45)}{\sin(90) - \cos(60)}$$

in the form  $\sqrt{a} + b$  where a and b are integers.

$$\begin{aligned} \frac{\frac{\sqrt{3}}{2} + 1}{1 - \frac{1}{2}} &= \frac{\frac{\sqrt{3}+2}{2}}{\frac{1}{2}} = \frac{\sqrt{3}+2}{2} \div \frac{1}{2} \\ &= \frac{\sqrt{3}+2}{2} \times \frac{2}{1} \\ &= \underline{\underline{\sqrt{3} + 2}} \end{aligned}$$

11.  
Find OP.

C A  
H



$$OP = 4\sqrt{2} \times \cos(45)$$

$$= 4\sqrt{2} \times \frac{\sqrt{2}}{2}$$

$$= \textcircled{4}$$

12.  
Show that

$$2(\sin 30 + \cos 30)(\tan 45 - \tan 60)$$

is a negative integer.

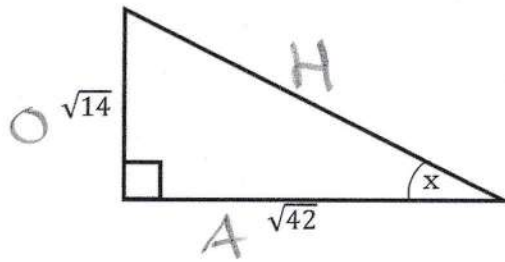
$$2 \left( \frac{1}{2} + \frac{\sqrt{3}}{2} \right) (1 - \sqrt{3})$$

$$= (1 + \sqrt{3})(1 - \sqrt{3})$$

$$= (1 - 3 + \sqrt{3} - \sqrt{3})$$

$$= \textcircled{-2}$$

13.  
Find x.



T<sup>o</sup> A

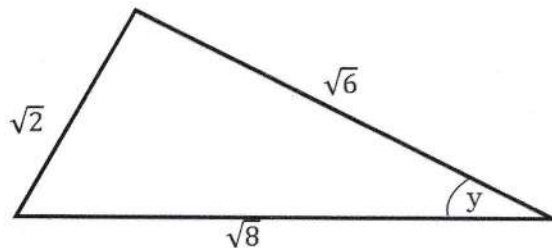
$$\tan(x) = \frac{\sqrt{14}}{\sqrt{42}}$$

$$= \frac{1}{\sqrt{3}}$$

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

$$x = 30^\circ$$

14.  
Find y.



$$(\sqrt{2})^2 = (\sqrt{8})^2 + (\sqrt{6})^2 - 2\sqrt{6}\sqrt{8}\cos(y)$$

$$2 = 8 + 6 - 2\sqrt{48}\cos(y)$$

$$2 = 14 - 2\sqrt{48}\cos(y)$$

$$-12 = -2\sqrt{48}\cos(y)$$

$$\frac{6}{\sqrt{48}} = \cos(y)$$

$$\frac{6}{4\sqrt{3}} = \frac{3}{2\sqrt{3}} = \frac{\sqrt{3} \times \sqrt{3}}{2\sqrt{3}} = \frac{\sqrt{3}}{2}$$

$$y = 30^\circ$$

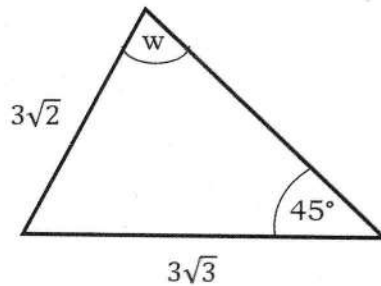
15.  
Express

$$(\tan 30 + \sin 60)^2$$

as a fully simplified mixed number

$$\begin{aligned} \left(\frac{\sqrt{3}}{3} + \frac{\sqrt{3}}{2}\right)^2 &= \left(\frac{2\sqrt{3} + 3\sqrt{3}}{6}\right)^2 \\ &= \left(\frac{5\sqrt{3}}{6}\right)^2 \\ &= \frac{75}{36} \\ &= \frac{25}{12} = 2\frac{1}{12} \end{aligned}$$

16.  
Find  $w$ .



$$\begin{aligned} \frac{\sin(w)}{3\sqrt{3}} &= \frac{\sin(45)}{3\sqrt{2}} \\ \frac{\sin(w)}{3\sqrt{3}} &= \frac{\sqrt{2}}{2} \times \frac{1}{3\sqrt{2}} = \frac{1}{6} \\ \sin(w) &= \frac{3\sqrt{3}}{6} \\ &= \frac{\sqrt{3}}{2} \end{aligned}$$

$$w = 60^\circ$$