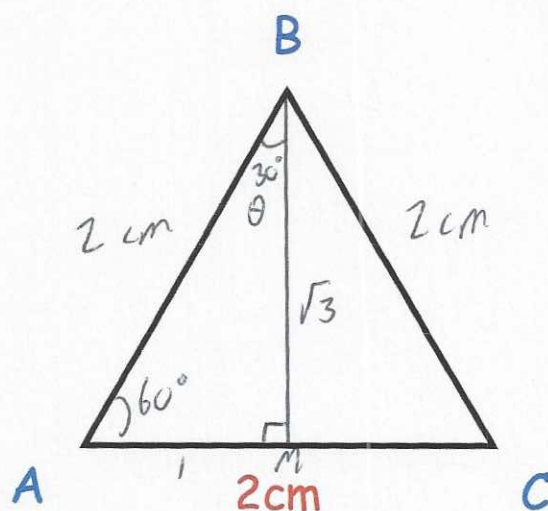


1. Shown below is an equilateral triangle, ABC, with side length 2cm.



$$BM^2 = 2^2 - 1^2$$

$$BM^2 = 3$$

$$BM = \sqrt{3}$$

- (a) By using the triangle, show $\sin 30^\circ = \frac{1}{2}$

$$\sin ABM = \frac{O}{H}$$

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

(2)

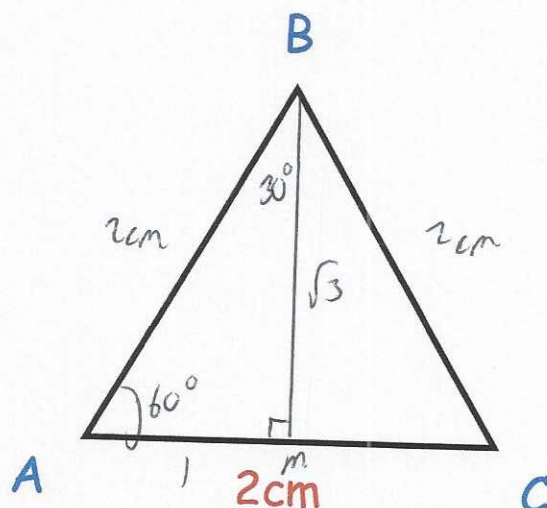
- (b) By using the triangle, show $\sin 60^\circ = \frac{\sqrt{3}}{2}$

$$\sin MAB = \frac{O}{H}$$

$$\sin 60^\circ = \frac{\sqrt{3}}{2}$$

(2)

2. Shown below is an equilateral triangle, ABC, with side length 2cm.



- (a) By using the triangle, show $\cos 30^\circ = \frac{\sqrt{3}}{2}$

$$\cos ABM = \frac{A}{H}$$

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

(2)

- (b) By using the triangle, show $\cos 60^\circ = \frac{1}{2}$

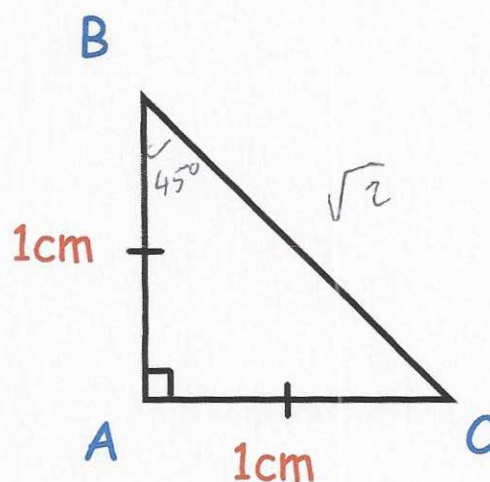
$$\cos MAB = \frac{A}{H}$$

$$\cos 60 = \frac{1}{2}$$

(2)

3. Shown below is an isosceles, right angled triangle, ABC.

$$AB = AC = 1\text{cm}$$



- (a) By using the triangle, show $\sin 45^\circ = \frac{\sqrt{2}}{2}$

$$\sin ABC = \frac{O}{H}$$

$$\sin 45^\circ = \frac{1}{\sqrt{2}} \quad \begin{array}{l} \times \sqrt{2} \\ \times \sqrt{2} \end{array}$$

$$\sin 45^\circ = \frac{\sqrt{2}}{2}$$

(2)

- (b) By using the triangle, show $\cos 45^\circ = \frac{\sqrt{2}}{2}$

$$\cos ABC = \frac{A}{H}$$

$$\cos 45^\circ = \frac{1}{\sqrt{2}} \quad \begin{array}{l} \times \sqrt{2} \\ \times \sqrt{2} \end{array}$$

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

(2)

4. Write down the exact value of $\sin 0^\circ$

0
(1)

5. Write down the exact value of $\cos 60^\circ$

$\frac{1}{2}$
(1)

6. Write down the exact value of $\sin 30^\circ$

$\frac{1}{2}$
(1)

7. Write down the exact value of $\tan 0^\circ$

0
(1)

8. Write down the exact value of $\tan 45^\circ$

1
(1)

9. Write down the exact value of $\cos 90^\circ$

0
(1)

10. Write down the exact value of $\sin 90^\circ$

1
(1)

11. Write down the exact value of $\sin 180^\circ$

0
(1)

12. Write down the exact value of $\cos 360^\circ$

1
(1)

13. Write down the exact value of $\sin 360^\circ$

0
(1)

14. Write down the exact value of $\cos 270^\circ$

0
(1)

15. Write down the exact value of $\tan 180^\circ$

0
(1)

16. Write down the exact value of $\sin 270^\circ$

-1
(1)

17. Write down the exact value of $\cos 180^\circ$

-1
(1)

18. Write down the exact value of $\sin 60^\circ$

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

(1)

19. Write down the exact value of $\cos 45^\circ$

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

(1)

20. Write down the exact value of $\sin 45^\circ$

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

(1)

21. Write down the exact value of $\tan 30^\circ$

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

(1)

22. Write down the exact value of $\tan 60^\circ$

$$\sqrt{3}$$

(1)

23. Write down the exact value of $\cos 30^\circ$

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

(1)

24. Write down the exact value of $\sin 120^\circ$

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

(1)

25. Write down the exact value of $\sin 150^\circ$

$\frac{1}{2}$
.....
(1)

26. Write down the exact value of $\cos 120^\circ$

$-\frac{1}{2}$
.....
(1)

27. Write down the exact value of $\sin 210^\circ$

$-\frac{1}{2}$
.....
(1)

28. Write down the exact value of $\tan 300^\circ$

$-\sqrt{3}$
.....
(1)

29. Write down the exact value of $\cos 540^\circ$

-1
.....
(1)

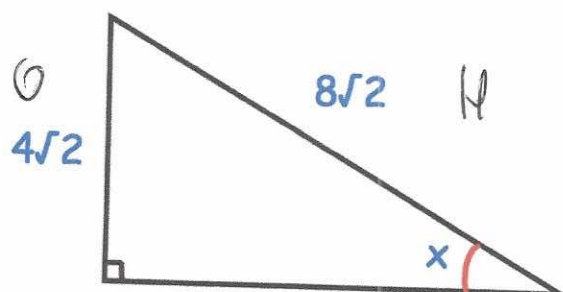
30. Write down the exact value of $\cos 570^\circ$

$-\frac{\sqrt{3}}{2}$
.....
(1)

31. Write down the exact value of $\sin 870^\circ$

$\frac{1}{2}$
.....
(1)

32. Below is a right angled triangle.



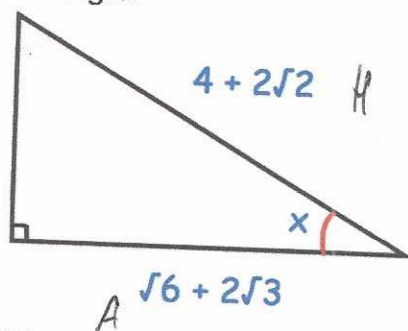
Show that angle $x = 30^\circ$
Include all your working.

$$\sin x = \frac{O}{H} = \frac{4\sqrt{2}}{8\sqrt{2}} = \frac{1}{2}$$

$$x = 30^\circ$$

(2)

33. Below is a right angled triangle.



Show that angle $x = 30^\circ$
Include all your working.

$$\cos x = \frac{A}{H} = \frac{\sqrt{6} + 2\sqrt{3}}{4 + 2\sqrt{2}} \times \frac{(4 - 2\sqrt{2})}{(4 - 2\sqrt{2})}$$

$$\frac{4\sqrt{6} - 2\sqrt{12} + 8\sqrt{3} - 4\sqrt{6}}{16 - 8} = \frac{-2\sqrt{12} + 8\sqrt{3}}{8}$$

$$= \frac{-4\sqrt{3} + 8\sqrt{3}}{8} = \frac{4\sqrt{3}}{8} \quad (2)$$

$$\cos x = \frac{\sqrt{3}}{2} \quad x = 30^\circ$$

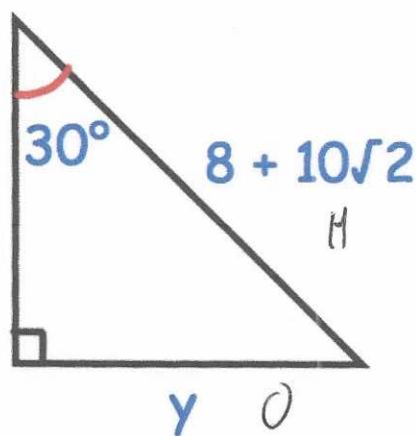
34. Find the exact value of $\sin(225^\circ) + \cos(150^\circ)$

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

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

.....
(3)

35. Shown below is a right angled triangle.



Find the exact length of the side labelled y .

$$\sin 30 = \frac{y}{8 + 10\sqrt{2}}$$

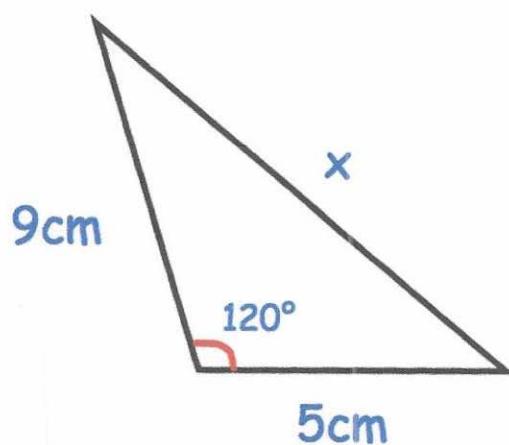
$$\frac{1}{2} = \frac{y}{8 + 10\sqrt{2}}$$

$$4 + 5\sqrt{2} = y$$

.....
 $4 + 5\sqrt{2}$

(4)

33. Shown below is a triangle.



Find the exact length of the side labelled x.

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$x^2 = 9^2 + 5^2 - 2 \times 9 \times 5 \times \cos 120$$

$$x^2 = 81 + 25 - 90 \left(-\frac{1}{2}\right)$$

$$x^2 = 151$$

$$x = \sqrt{151}$$

.....cm
(4)