Name:

Exam Style Questions

Trigonometry: Exact Values

Corbettmaths

Equipment needed: Pen

Guidance

1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings

Video Tutorial

www.corbettmaths.com/contents

Video 341

Answers and Video Solutions

1. Write down the exact value of Sin 0°

0

(1)

2. Write down the exact value of Cos 60°

$\frac{1}{2}$

(1)

3. Write down the exact value of Sin 30°

$\frac{1}{2}$

(1)

4. Write down the exact value of Tan 0°

0

(1)

5. Write down the exact value of Tan 45°

1

(1)

6. Write down the exact value of Cos 90°

0

(1)

7. Write down the exact value of Sin 90°

1

.....

(1)

8. Write down the exact value of Sin 60°

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

.....

(1)

9. Write down the exact value of Cos 45°

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

.....

(1)

10. Write down the exact value of Sin 45°

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

.....

(1)

11. Write down the exact value of Tan 30°

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

.....

(1)

12. Write down the exact value of Tan 60°

$\sqrt{3}$

.....

(1)

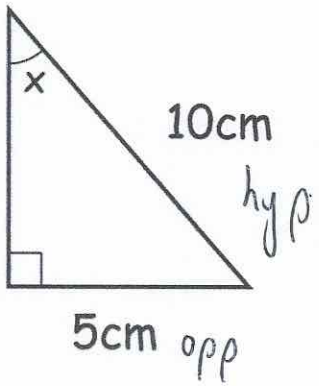
13. Write down the exact value of Cos 30°

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

.....

(1)

14. Shown below is a right angled triangle.



Use trigonometry to work out the size of angle x.

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

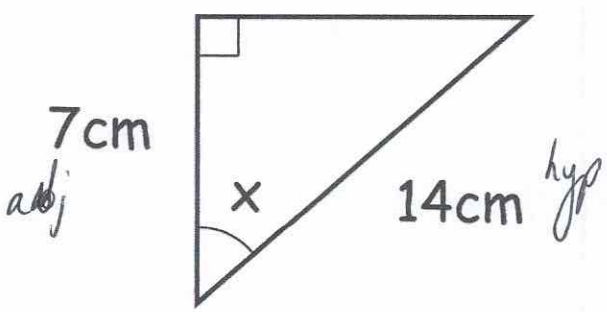
$\sin x = \frac{5}{10}$

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

30 .....°

(2)

15. Shown below is a right angled triangle.



Work out the size of angle x.

$\cos x = \frac{adj}{hyp}$

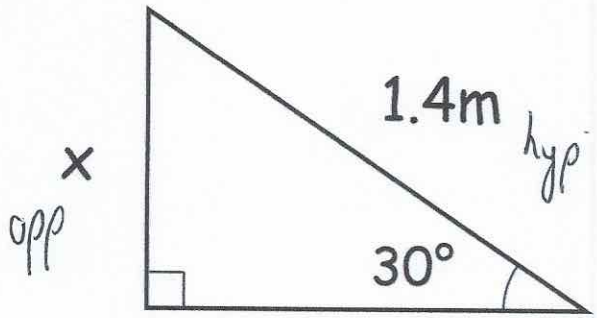
$\cos x = \frac{7}{14}$

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

60 .....°

(2)

16. Shown below is a right angled triangle.



Use trigonometry to work out the value of x.

$\sin\theta = \frac{opp}{hyp}$

$\sin 30 = \frac{x}{1.4}$

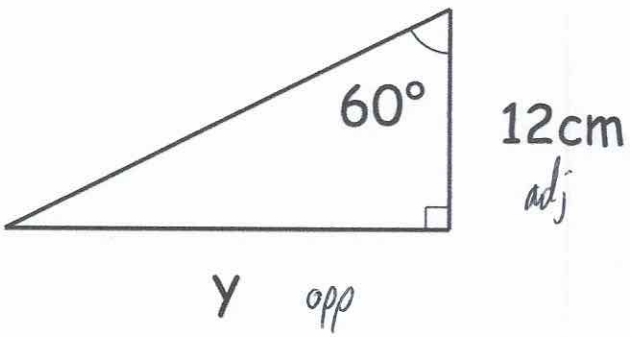
$x = \frac{1}{2} \times 1.4$

$x = 0.7$

0.7 .....m

(3)

17. Shown below is a right angled triangle.



Use trigonometry to work out the exact value of y.

$\tan\theta = \frac{opp}{adj}$

$\tan 60 = \frac{y}{12}$

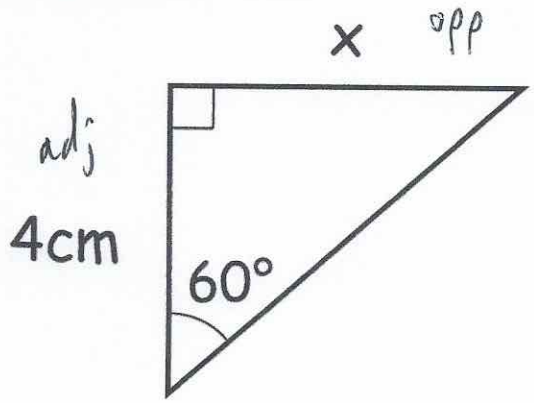
$\sqrt{3} = \frac{y}{12}$

$y = 12\sqrt{3}$

$12\sqrt{3}$ .....cm

(3)

18. Shown below is a right angled triangle.



Use trigonometry to work out the exact value of x

$\tan 60 = \frac{x}{4}$

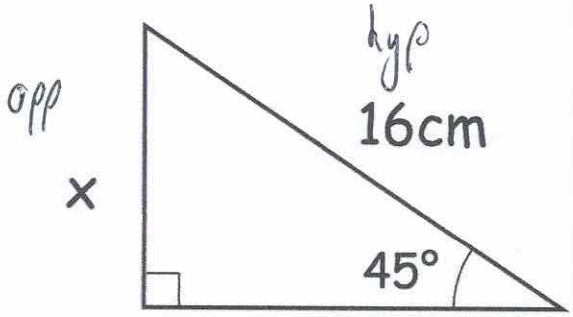
$\sqrt{3} = \frac{x}{4}$

$x = 4\sqrt{3}$

$4\sqrt{3}$ .....cm

(3)

19. Shown below is a right angled triangle.



Use trigonometry to work out the exact value of x

$\sin\theta = \frac{opp}{hyp}$

$\sin 45 = \frac{x}{16}$

$16 \times \sin 45 = x$

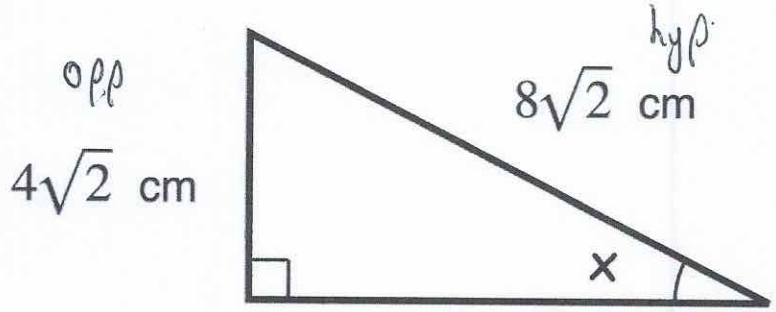
$x = \frac{\sqrt{2}}{2} \times 16$

$x = 8\sqrt{2}$

$8\sqrt{2}$ .....cm

(3)

20. Below is a right angled triangle.



Show that angle $x = 30°$
Include all your working.

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

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

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

$x = 30°$

(3)

21. Find the exact value of $sin60° \times cos30°$

Give your answer in its simplest form.

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

$\frac{3}{4}$

.....

(2)

22. Find the exact value of $tan30° \div tan60°$

Give your answer in its simplest form.

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

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

$\frac{1}{3}$

.....

(2)

23. Find the exact value of $12\,tan60° \times sin60° \times 4\,cos60°$

$12\sqrt{3} \times \frac{\sqrt{3}}{2} \times 4\left(\frac{1}{2}\right)$

$\frac{12\sqrt{3}}{1} \times \frac{\sqrt{3}}{2} \times 2$

$= \frac{24 \times 3}{2} = 36$

36

.....

(3)

24. Find the exact value of $\sin 45° + \cos 30°$

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

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

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

.....

(3)

25. Find the exact value of $15\,tan30° - 4\,sin60°$

$15\left(\frac{\sqrt{3}}{3}\right) - 4\left(\frac{\sqrt{3}}{2}\right)$

$5\sqrt{3} - 2\sqrt{3}$

$= 3\sqrt{3}$

$3\sqrt{3}$

.....

(3)

26. Show $\frac{cos60° - sin45°}{tan60°}$ can be written as $\frac{\sqrt{a} - \sqrt{b}}{c}$

where a, b and c are integers.

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

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

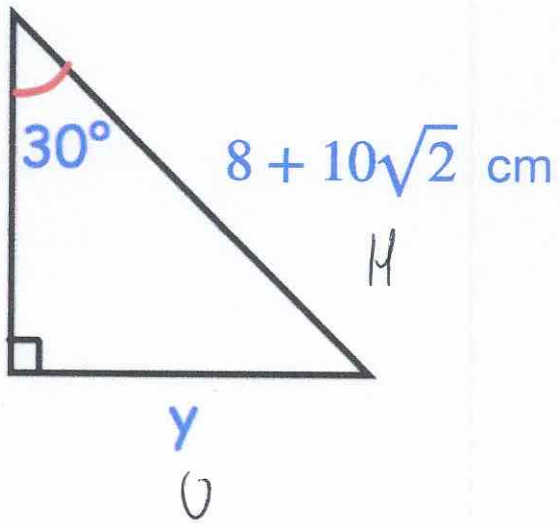
$$= \frac{1 - \sqrt{2}}{2\sqrt{3}} \quad \times \sqrt{3} \quad \times \sqrt{3}$$

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

$$= \frac{\sqrt{3} - \sqrt{6}}{6}$$

(4)

27. Shown below is a right angled triangle.



Find the exact length of the side labelled y.

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

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

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

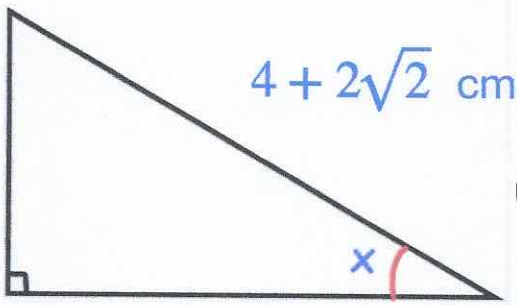
$y = 4 + 5\sqrt{2}$

$4 + 5\sqrt{2}$

.....cm

(4)

28. Below is a right angled triangle.



H

A

Show that angle $x = 30°$
Include all your working.

$$\cos x = \frac{\sqrt{6} + 2\sqrt{3}}{4 + 2\sqrt{2}}$$

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

$\sqrt{12} = \sqrt{4} \times \sqrt{3}$
$= 2\sqrt{3}$

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

$$\cos x = \frac{-4\sqrt{3} + 8\sqrt{3}}{8}$$

$$\cos x = \frac{4\sqrt{3}}{8}$$

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

$x = 30°$ ✓

(4)