

AQA, Edexcel, OCR

A Level

A Level Mathematics

Know and use exact values of sin and cos,
tan and multiples thereof

Name:

M M E

Mathsmadeeasy.co.uk

Total Marks:

E3- Know and use exact values of sin and cos for $0, \frac{\pi}{6}, \frac{\pi}{4}, \frac{\pi}{3}, \frac{\pi}{2}, \pi$ and multiples thereof, and exact values

of tan for $0, \frac{\pi}{6}, \frac{\pi}{4}, \frac{\pi}{2}, \pi$ and multiples thereof- Questions

AQA, Edexcel, OCR

- 1) Evaluate the following expression [2]
$$\cos 45^\circ \cos 30^\circ + \sin 45^\circ \sin 30^\circ$$
- 2) If $\cos \frac{\pi}{6} \sin \frac{\pi}{3} \tan \frac{\pi}{6} = \frac{1}{4x}$, then what is the value of x? [2]
- 3) If $\sin^2 \frac{\pi}{6} + 1 = x + \cos^2 \frac{\pi}{3}$, then what is the value of x? [2]
- 4) If $\alpha + \beta + \gamma = 180^\circ$, then what is the value of $\sin\left(\frac{\alpha}{2} + \frac{\beta}{2}\right)$? [2]
- 5) What is the solution of $\tan \theta + \sqrt{3} = 0$ in $\left[0, \frac{\pi}{2}\right]$? [2]
- 6) What is the smallest positive angle for which $2\sin^2 \theta + \sqrt{3}\cos \theta + 1 = 0$? [4]
- 7) What is the general solution of the trigonometric equation $\tan \theta = \cot \alpha$? [3]
- 8) What is the number of solutions of $\tan^3 \theta = 0$ in the interval $\left[\pi, \frac{3\pi}{2}\right]$? [2]
- 9) Find the value of $\sin 50^\circ - \sin 70^\circ + \sin 10^\circ$? [3]
- 10) If $\sin(\alpha - \beta) = -\frac{1}{2}$ and $\cos(\alpha + \beta) = \frac{1}{2}$ then find the values of α & β ? [2]
- 11) If $\cot \alpha \cot \beta = 2$ then what is the value of $\frac{\cos(\alpha + \beta)}{\cos(\alpha - \beta)}$? [4]
- 12) If $\cos \theta + \sec \theta = 2$ then what is the value of $\cos^2 \theta + \sec^2 \theta$ [2]
- 13) If $\alpha + \beta = 90^\circ$ and $\alpha - \beta = 30^\circ$ then what will be the value of $\sin 3\alpha$? [1]
- 14) If $\sqrt{\frac{1 + \sin \alpha}{1 - \sin \alpha}} = 4$ then what is the value of $\frac{\sin \frac{\alpha}{2} + \cos \frac{\alpha}{2}}{\sin \frac{\alpha}{2} - \cos \frac{\alpha}{2}}$? [4]
- 15) Find the value of $\cos \frac{\pi}{12}$. [2]
- 16) Simplify the expression $\sin(\alpha - \beta) + 2\cos \alpha \sin \beta$. [2]

- 17) What is the reference angle of $\cos\theta = -\frac{1}{2}$? [2]
- 18) What is the solution of $\sqrt{3}\csc\theta + 2 = 0$ in $[0, 2\pi]$? [2]
- 19) What is the solution of $\sin\theta = -\frac{1}{2}$ in $[0, 2\pi]$? [2]
- 20) What is the solution of $\sec^2\theta = 2$ in $[\pi, 2\pi]$? [2]
- 21) What is the solution set of $\frac{\tan 3x - \tan 2x}{1 + \tan 3x \tan 2x} = 1$? [2]
- 22) Find the most general value of θ which satisfies both equations $\sin\theta = -\frac{1}{2}$ & $\tan\theta = \frac{1}{\sqrt{3}}$. [2]
- 23) What is the solution of $(2\cos x - 1)(3 + 2\cos x) = 0$ in the interval $0 \leq x \leq 2\pi$? [3]
- 24) What is the number of roots of quadratic equation $8\sec^2\theta - 6\sec\theta + 1 = 0$? [2]
- 25) What is the most general solution of $\tan\theta = -1$ and $\cos\theta = \frac{1}{\sqrt{2}}$? [2]
- 26) What is the number of solutions of $\sin^2\theta = \frac{1}{2}$ in the interval $\left[0, \frac{3\pi}{2}\right]$? [2]
- 27) What is the most general solution of $\sin\alpha + \cos\alpha = \sqrt{2}\sin\theta$? [2]
- 28) Find the most general value of θ which satisfies the equations $\cos\theta = -\frac{1}{\sqrt{2}}$ & $\tan\theta = 1$ [2]
- 29) What is the most general solution of $\sin\theta + \sqrt{3}\cos\theta = 2$? [4]
- 30) For what value of θ the equation is true $\cot\theta = \sin 2\theta$ in the interval $[0, 2\pi]$? [4]