SOLVING TRIGONOMETRIC EQUATIONS

Give answers correct to 3 decimal places where necessary.

1 Solve each equation for $0° \leq x \leq 180°$.

(a) $3 + 2\cos x = 5\cos x$ **(b)** $\sin x = 3\cos x$ **(c)** $6\sin 2x = 3\cos 30°$

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1 Solve each equation for $0° \leq x \leq 180°$.

(d) $4 - 3\tan x = \tan x$ **(e)** $3\sin x = \cos x$ **(f)** $\sin 2x = \sin 30°$

3 Solve each equation for $0° \leq x \leq 360°$.

(a) $\text{cosec}^2 x = 2$ **(b)** $\sin^2 x = 1$ **(c)** $\tan^2 x = 3$

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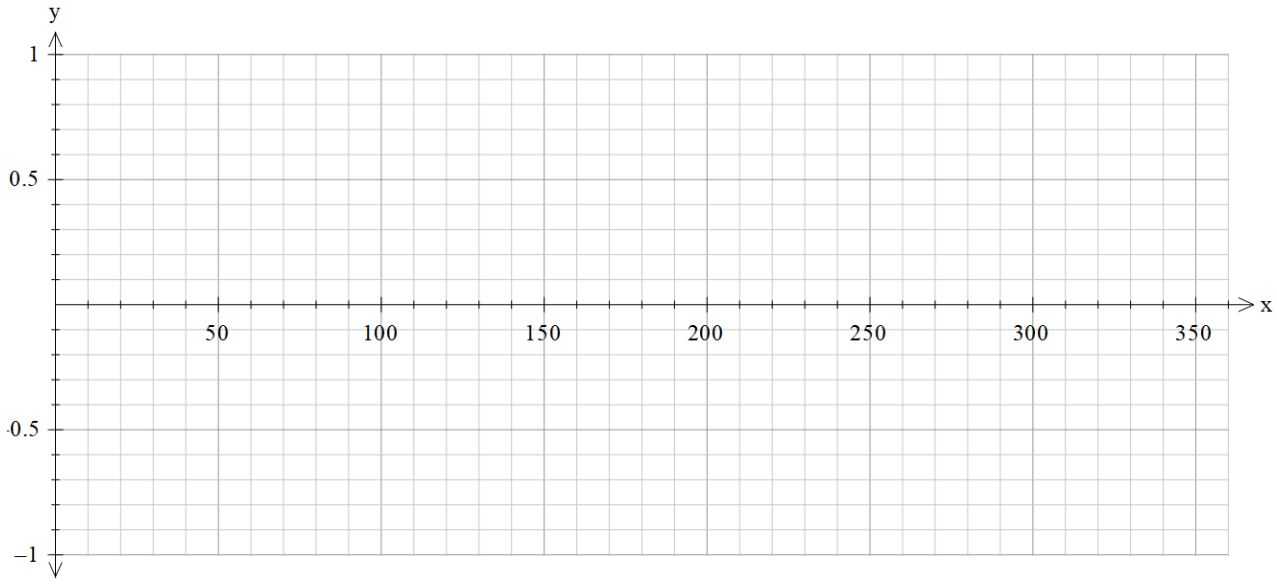
4 **(a)** On the same diagram draw $y = \sin x$ and $y = \frac{1}{2}$ for $0° \leq x \leq 360°$. Use your diagram to solve the equation $\sin x = \frac{1}{2}$ for $0° \leq x \leq 360°$.

(b) What line would you need to draw to solve the equation $\sin x = -\frac{1}{2}$? What are the solutions to this equation for $0° \leq x \leq 360°$?



5 Solve, for $0 \leq \theta \leq 2\pi$:

(a) $\sin\theta = \frac{-1}{\sqrt{2}}$ **(b)** $\sec\theta = \frac{2}{\sqrt{3}}$ **(c)** $\cot\theta = 1$

(d) $\sin^2\theta - 2\cos\theta + \cos^2\theta = 0$ **(e)** $\sin^2\theta + \cos\theta - 1 = 0$ **(f)** $\sec^2\theta - 2\tan\theta = 0$

14 Solve for $0 < x < 2\pi$: **(a)** $5\cos^2 x + 8\sin x - 8 = 0$ **(b)** $6\tan x = 5\cot x$

15 Simplify:

(a) $1+\tan^2(\frac{\pi}{2}-\theta)$ **(b)** $1-\cos^2(\pi+\theta)$ **(c)** $\sin\theta\cos(\frac{\pi}{2}-\theta)+\cos\theta\sin(\frac{\pi}{2}-\theta)$

(d) $\cos^2\frac{\pi}{6}-1$ **(e)** $1-\sin\theta\cos(\frac{\pi}{2}-\theta)$

18 Solve for $0 \leq \theta \leq 2\pi$:

(a) $3\tan^3\theta - 3\tan^2\theta - \tan\theta + 1 = 0$ **(b)** $\cos^3\theta - 2\cos^2\theta + \cos\theta = 0$