0606 Additional Mathematics Paper 2 - Trigonometry

Topical questions | 16 questions

1. Question | 0606 Feb-March 2025 P2 V2 Q8

8 **(a)** Show that $\dfrac{\sin\theta\tan^2\theta}{1+\tan^2\theta}$ can be written as $\sin^3\theta$. [2]

(b) Hence solve the equation $\dfrac{\sin 3x\tan^2 3x}{1+\tan^2 3x}=\dfrac{1}{8}$ for $-180° \leqslant x \leqslant 180°$. [5]

2. Question | 0606 Feb-March 2025 P2 V2 Q11

11 Solve the equation $\cot(y+1.5)=3$ where y is in radians and $0<y<6$. [4]

3. Question part 1/2 | 0606 May-June 2025 P2 V1 Q8

8 **(a)** Solve the equation $(2-3\cot x)\cos x = 0$ for $0 < x \leqslant \frac{\pi}{2}$. [3]

3. Question part 2/2 | 0606 May-June 2025 P2 V1 Q8

(b) Solve the equation $2\operatorname{cosec}(2\theta+1)-12\sin(2\theta+1)=5$, where θ is in radians and $-1 \leqslant \theta \leqslant 2$. [6]

4. Question part 1/2 | 0606 May-June 2025 P2 V2 Q9

9 **(a)** Solve the equation $3\sec 3x = \sqrt{3}\operatorname{cosec} 3x$ for $-120° \leqslant x \leqslant 120°$. [5]

4. Question part 2/2 | 0606 May-June 2025 P2 V2 Q9

(b) Solve the equation $2\cos\left(y+\frac{\pi}{3}\right)\sin\left(y+\frac{\pi}{3}\right)=\sin\left(y+\frac{\pi}{3}\right)$ for $0 \leqslant y < 2\pi$. [5]

Question 10 is printed on the next page.

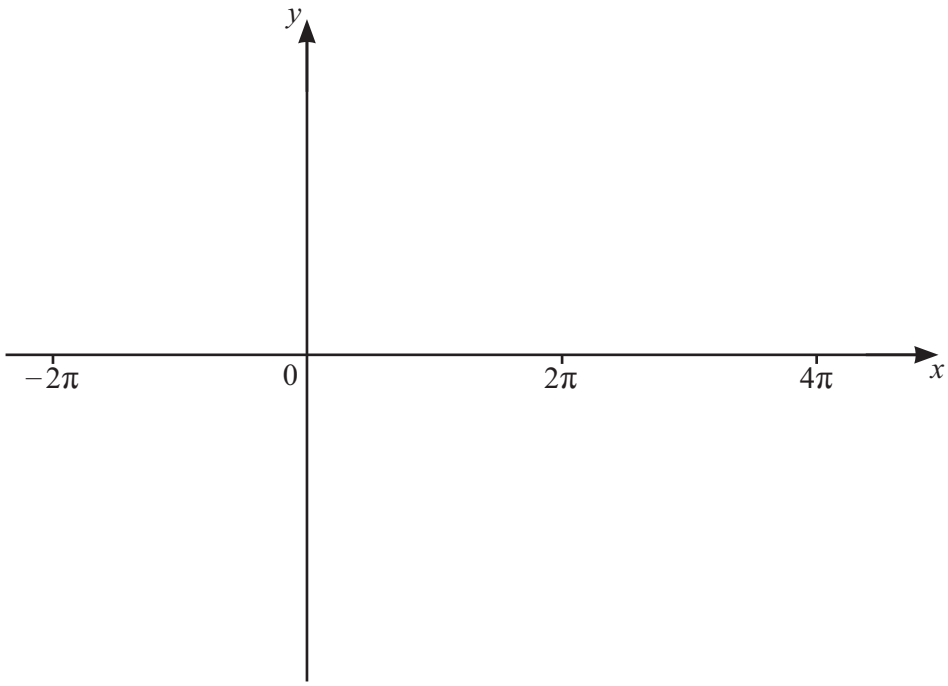
5. Question | 0606 May-June 2025 P2 V3 Q5

5 In this question, all angles are in radians.

(a) Write down the period of $5\tan\left(\frac{x}{4}\right)+1$. [1]

(b) On the axes, sketch the graph of $y = 5\tan\left(\frac{x}{4}\right)+1$ for $-2\pi \leqslant x \leqslant 4\pi$.

State the intercept with the y-axis.
Show clearly the positions of any asymptotes. [3]



6. Question | 0606 Oct-Nov 2025 P2 V1 Q4

4 **(a)** Show that $\frac{1-\sin x}{\cos x}+\frac{\cos x}{1-\sin x}=2\sec x$. [3]

(b) Hence solve the equation $\frac{1-\sin\frac{\theta}{2}}{\cos\frac{\theta}{2}}+\frac{\cos\frac{\theta}{2}}{1-\sin\frac{\theta}{2}}=3$ for $0°\leqslant\theta\leqslant 720°$. [3]

7. Question | 0606 Oct-Nov 2025 P2 V1 Q13

13 Solve the equation $2\sin^3\theta = 3\sin\theta\cos\theta$ for $-\frac{\pi}{2} \leqslant \theta \leqslant \frac{\pi}{2}$. [6]

8. Question part 1/2 | 0606 Oct-Nov 2025 P2 V2 Q11

11 **(a)** Solve the equation $\tan^2 2x - 4\tan 2x = 0$ for $0° \leqslant x \leqslant 180°$. [4]

8. Question part 2/2 | 0606 Oct-Nov 2025 P2 V2 Q11

(b) Solve the equation $\operatorname{cosec}(y+1.2)=4$, where y is in radians and $-5<y<2$. [6]

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9. Question | 0606 Oct-Nov 2025 P2 V3 Q7

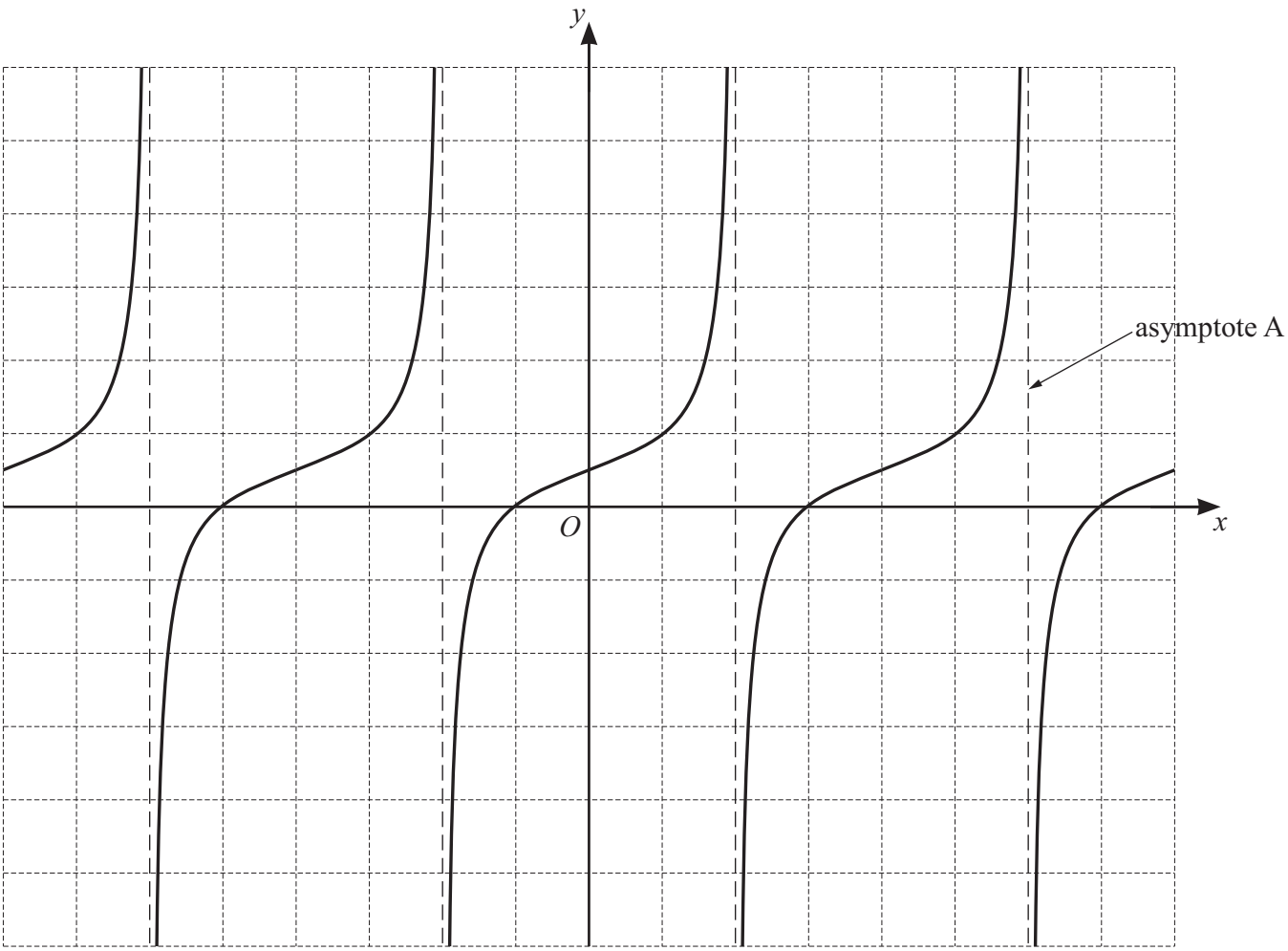
7 Solve the equation $\sec^2 3x + \tan 3x - 3 = 0$ for $0° \leqslant x \leqslant 120°$. [6]

8 **(a)** **(i)** Show that $\frac{\cos^2 2x}{1+\sin 2x} = 1 - \sin 2x$. [2]

(ii) Hence solve the equation for $\frac{3\cos^2 2x}{1+\sin 2x} = 1$ for $0° \leqslant x \leqslant 90°$. [4]

(b) Solve the equation $\cot\left(y - \frac{\pi}{2}\right) = \sqrt{3}$, where y is in radians and $0 \leqslant y \leqslant \pi$. [3]

6 **(a)** The diagram shows part of the graph of $y = 1 + \tan\frac{1}{2}x$ where x is measured in degrees.

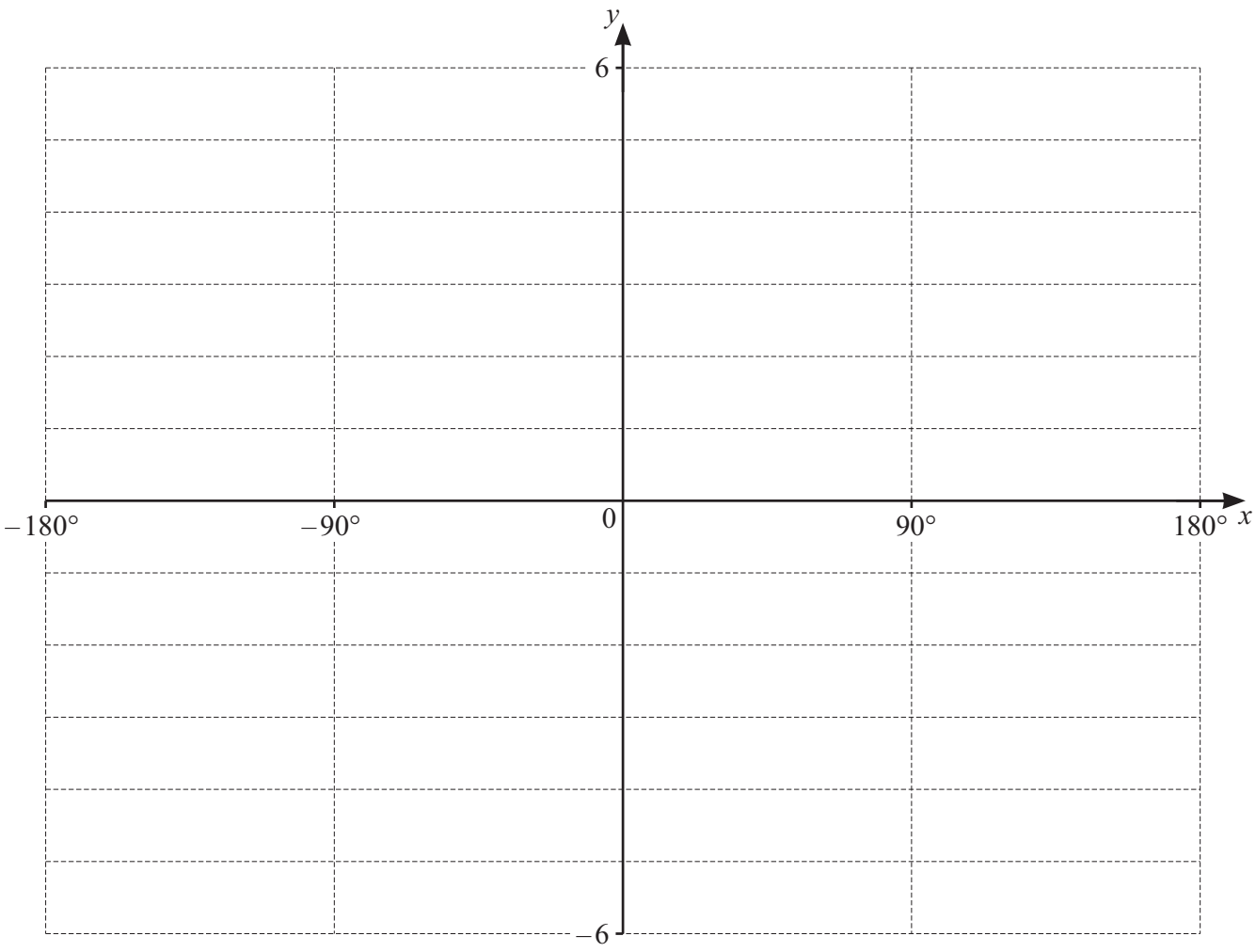


(i) Write down the period of $1 + \tan\frac{1}{2}x$. [1]

(ii) Write down the equation of the asymptote A. [1]

11. Question part 2/2 | 0606 Feb-March 2026 P2 V2 Q6

(b) On the axes below, sketch the graph of $y = 3\cos 2x + 1$ for $-180° \leqslant x \leqslant 180°$. [3]



12. Question part 1/2 | 0606 Feb-March 2026 P2 V2 Q9

9 **(a)** Show that $\tan\theta + \cot\theta + 2\sec\theta$ can be written as $\dfrac{1+2\sin\theta}{\sin\theta\cos\theta}$. [3]

(b) Hence solve the equation $\tan 2x + \cot 2x + 2\sec 2x = 0$ for $-180° \leqslant x \leqslant 180°$. [4]

12. Question part 2/2 | 0606 Feb-March 2026 P2 V2 Q9

(c) Solve the equation $3\sec(x-1)-1=\tan^2(x-1)$ where x is in radians and $-1<x<3$. [5]

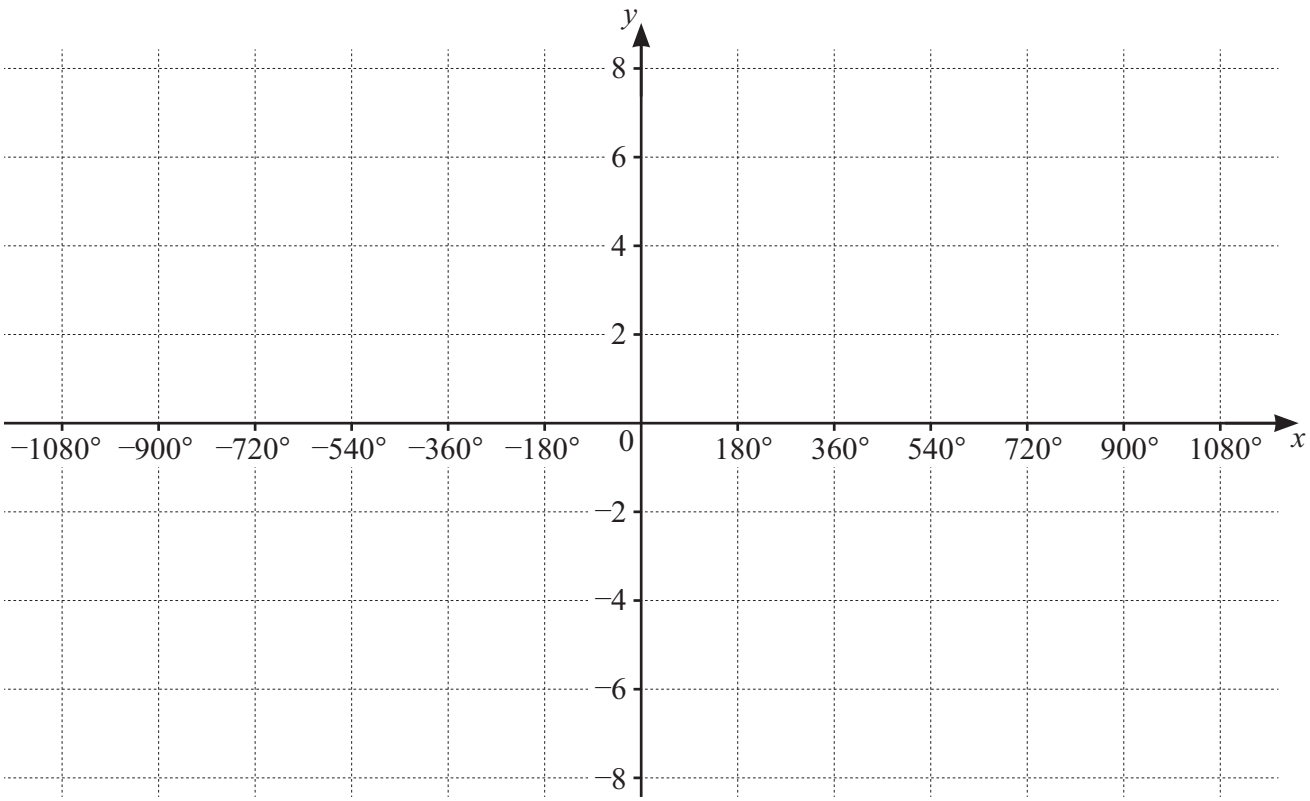
13. Question | 0606 May-June 2026 P2 V1 Q2

2 **(a)** Write down the amplitude of $4\cos\left(\frac{x}{8}\right)+2$. [1]

(b) Write down the period, in degrees, of $4\cos\left(\frac{x}{8}\right)+2$. [1]

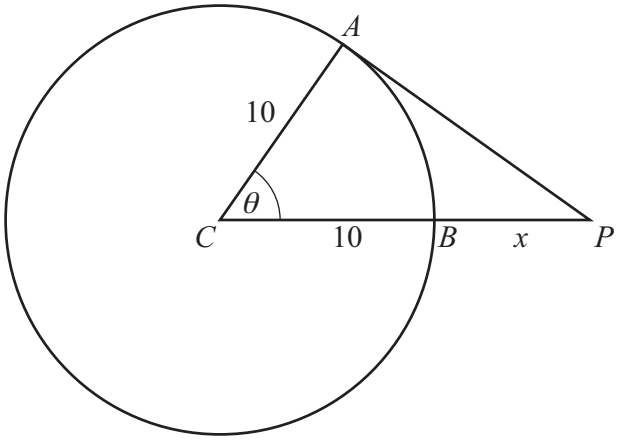
(c) Solve the equation $4\cos\left(\frac{x}{8}\right)+2=0$ for $-1080° \leqslant x \leqslant 1080°$. [3]

(d) On the axes sketch the graph of $y=4\cos\left(\frac{x}{8}\right)+2$ for $-1080° \leqslant x \leqslant 1080°$. [2]



14. Question part 1/2 | 0606 May-June 2026 P2 V1 Q8

8 In this question lengths are in centimetres and angles are in radians.



The diagram shows a circle, centre C, radius 10.
The points A and B lie on the circumference of the circle.
The point P is such that CBP is a straight line.
The line BP has length x.
The line AP is a tangent to the circle at A.
Angle ACB is θ.
The perimeter of the triangle APC is 38.

(a) Show that the value of θ is 0.885 radians correct to 3 decimal places. [6]

(b) Find the length of the arc AB. [1]

(c) Find the area of the sector ACB. [1]

15. Question | 0606 May-June 2026 P2 V1 Q9

9 Solve the equation $5-2\operatorname{cosec}(\theta-0.5)=0$ where θ is in radians and $-3.5 \leqslant \theta \leqslant 3.5$. [5]

16. Question | 0606 May-June 2026 P2 V2 Q10

10 Solve the equation $\tan(3x+1) = 5\sin(3x+1)$ for $-\frac{\pi}{3} < x < \frac{\pi}{3}$. [6]