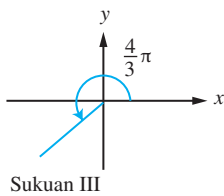


TINGKATAN 5

BAB 6

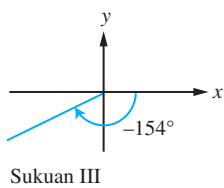
Uji Diri 1

1 (a)



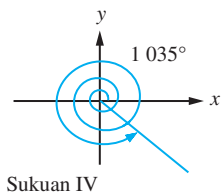
$$\frac{4}{3}\pi = \frac{4}{3}(180^\circ) = 240^\circ$$

(b)



$$-154^\circ = 360^\circ - 154^\circ = 206^\circ$$

(c)



$$1\,035^\circ = 1\,035^\circ - 720^\circ = 315^\circ$$

Uji Diri 2

1 (a) $\cos 57^\circ = \cos (90^\circ - 33^\circ) = \sin 33^\circ = b$

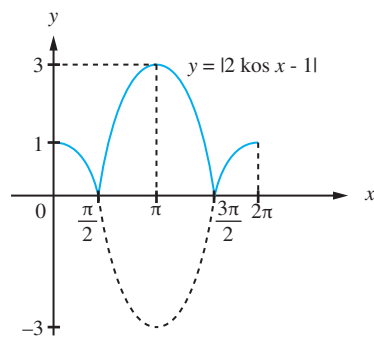
(b) $\operatorname{cosec} 147^\circ = \frac{1}{\sin 147^\circ} = \frac{1}{\sin (180^\circ - 33^\circ)} = \frac{1}{\sin 33^\circ} = \frac{1}{b}$

(c) $\sec 213^\circ = \frac{1}{\cos 213^\circ} = \frac{1}{\cos (180^\circ + 33^\circ)} = \frac{1}{-\cos 33^\circ} = -\frac{1}{\cos 33^\circ} = -\frac{1}{a}$

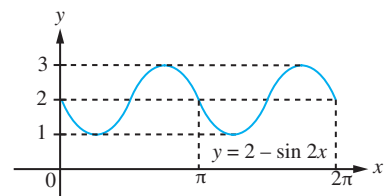
(d) $\frac{11}{60}\pi = \frac{11}{60}(180^\circ) = 33^\circ$
 $\sin \frac{11}{60}\pi = \sin 33^\circ = b$

Uji Diri 3

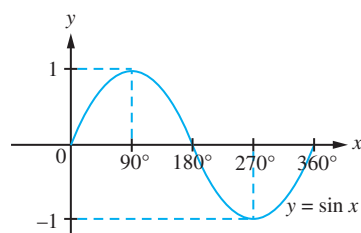
1 (a)



(b) $y = 2 - \sin 2x = -\sin 2x + 2$



2 (a)



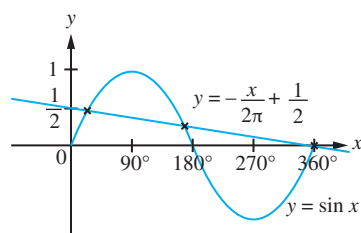
(b) $\frac{x}{2\pi} + 2 \sin x - 1 = 0$

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

$$\sin x = -\frac{x}{4\pi} + \frac{1}{2}$$

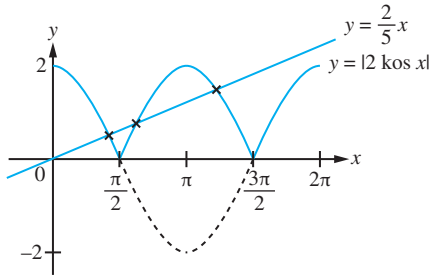
$$\therefore y = -\frac{x}{4\pi} + \frac{1}{2}$$

(c)



Bilangan penyelesaian = 3

3



Bilangan penyelesaian = 3

Uji Diri 4

- 1 (a)
- $\tan x + \cot x = \sec x \csc x$

Sebelah kiri:

$$\begin{aligned}\tan x + \cot x &= \frac{\sin x}{\cos x} + \frac{\cos x}{\sin x} \\&= \frac{\sin^2 x + \cos^2 x}{\sin x \cos x} \\&= \frac{1}{\sin x \cos x} \\&= \left(\frac{1}{\sin x}\right) \left(\frac{1}{\cos x}\right) \\&= \sec x \csc x \text{ (Sebelah kanan)}\end{aligned}$$

- (b)
- $\frac{1 - \sin x}{\cos x} + \frac{\cos x}{1 - \sin x} = 2 \sec x$

Sebelah kiri:

$$\begin{aligned}\frac{1 - \sin x}{\cos x} + \frac{\cos x}{1 - \sin x} &= \frac{(1 - \sin x)^2 + \cos^2 x}{\cos x (1 - \sin x)} \\&= \frac{1 - 2 \sin x + \sin^2 x + \cos^2 x}{\cos x (1 - \sin x)} \\&= \frac{2 - 2 \sin x}{\cos x (1 - \sin x)} \\&= \frac{2(1 - \sin x)}{\cos x (1 - \sin x)} \\&= \frac{2}{\cos x} \\&= 2 \sec x \text{ (Sebelah kanan)}\end{aligned}$$

- 2
- $\cot^2 x - \cos^2 x = \cot^2 x \cos^2 x$

$$\begin{aligned}\text{Sebelah kiri: } \cot^2 x - \cos^2 x &= \frac{\cos^2 x}{\sin^2 x} - \cos^2 x \\&= \frac{\cos^2 x - \sin^2 x \cos^2 x}{\sin^2 x} \\&= \frac{\cos^2 x (1 - \sin^2 x)}{\sin^2 x} \\&= \frac{\cos^2 x}{\sin^2 x} (\cos^2 x) \\&= \cot^2 x \cos^2 x \text{ (Sebelah kanan)}\end{aligned}$$

Uji Diri 5

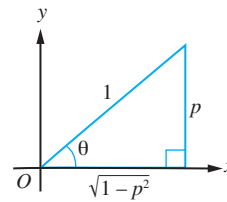
- 1 (a)
- $\frac{\cos^2 A}{1 + \sin A} + \sin A = 1$

$$\begin{aligned}\frac{\cos^2 A}{1 + \sin A} + \sin A &= \frac{\cos^2 A + \sin A + \sin^2 A}{1 + \sin A} \\&= \frac{1 + \sin A}{1 + \sin A} \\&= 1 \text{ (Terbukti)}\end{aligned}$$

- (b)
- $\frac{\sin A + \tan A}{1 + \cos A} = \tan A$

$$\begin{aligned}\frac{\sin A + \tan A}{1 + \cos A} &= \frac{\sin A + \frac{\sin A}{\cos A}}{1 + \cos A} \\&= \frac{\sin A \cos A + \sin A}{\cos A (1 + \cos A)} \\&= \frac{\sin A (\cos A + 1)}{\cos A (1 + \cos A)} \\&= \tan A \text{ (Terbukti)}\end{aligned}$$

- 2
- $\sin \theta = p$



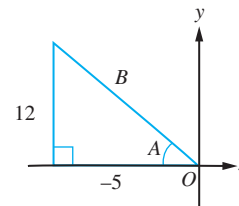
(a) $\tan \theta = \frac{p}{\sqrt{1-p^2}}$

$$\begin{aligned}\text{(b) } \cot(\pi - \theta) &= \frac{1}{\tan(\pi - \theta)} \\&= -\frac{1}{\tan \theta} \\&= -\frac{1}{\frac{p}{\sqrt{1-p^2}}} \\&= -\frac{\sqrt{1-p^2}}{p}\end{aligned}$$

$$\begin{aligned}\text{(c) } \sin(0.5\pi + \theta) &= \sin(0.5\pi) \cos \theta + \cos(0.5\pi) \sin \theta \\&= \cos \theta + 0 \\&= \sqrt{1-p^2}\end{aligned}$$

$$\begin{aligned}\text{(d) } \csc(2\pi - \theta) &= \frac{1}{\sin(2\pi - \theta)} \\&= -\frac{1}{\sin \theta} \\&= -\frac{1}{p}\end{aligned}$$

3



$$\begin{aligned}\text{(a) } \cos 2A &= 2 \cos^2 A - 1 \\&= 2 \left(-\frac{5}{13}\right)^2 - 1 \\&= 2 \left(\frac{25}{169}\right) - 1 \\&= -\frac{119}{169}\end{aligned}$$

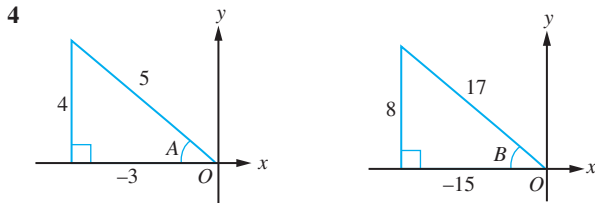
(b) $\cos A = 1 - 2 \sin^2 \frac{A}{2}$

$$\begin{aligned}2 \sin^2 \frac{A}{2} &= 1 - \cos A \\ \sin^2 \frac{A}{2} &= \frac{1 - \cos A}{2} \\ \sin \frac{A}{2} &= \sqrt{\frac{1 - \cos A}{2}} \\&= \sqrt{\frac{1 - \left(-\frac{5}{13}\right)}{2}} \\&= \sqrt{\frac{18}{26}} \\&= \sqrt{\frac{9}{13}}\end{aligned}$$

$$\begin{aligned}\text{(c) } \sin 3A &= \sin(A + 2A) \\&= \sin A \cos 2A - \cos A \sin 2A\end{aligned}$$

$$\cos 2A = -\frac{119}{169} \quad \leftarrow \text{Jawapan di (a)}$$

$$\begin{aligned}\sin 2A &= 2 \sin A \cos A \\ &= 2 \left(\frac{12}{13} \right) \left(-\frac{5}{13} \right) \\ &= -\frac{120}{169} \\ \sin 3A &= \left(\frac{12}{13} \right) \left(-\frac{119}{169} \right) - \left(-\frac{5}{13} \right) \left(-\frac{120}{169} \right) \\ &= \frac{-1428 - 600}{2197} \\ &= -\frac{12}{13}\end{aligned}$$



$$\begin{aligned}\text{(a) } \sin(A+B) &= \sin A \cos B + \cos A \sin B \\ &= \frac{4}{5} \left(-\frac{5}{17} \right) + \left(-\frac{3}{5} \right) \left(\frac{8}{17} \right) \\ &= -\frac{84}{85}\end{aligned}$$

$$\begin{aligned}\text{(b) } \tan(360^\circ - B) &= -\tan B \\ &= -\left(-\frac{8}{15} \right) \\ &= \frac{8}{15}\end{aligned}$$

$$\begin{aligned}\text{(c) } \cos \frac{B}{2} - \cos(A+45^\circ) & \\ \cos B &= 2 \cos^2 \frac{B}{2} - 1 \\ -\frac{15}{17} &= 2 \cos^2 \frac{B}{2} - 1 \\ \frac{2}{17} &= 2 \cos^2 \frac{B}{2} \\ \cos \frac{B}{2} &= \sqrt{\frac{1}{17}} \\ \sqrt{\frac{1}{17}} - [\cos A \cos 45^\circ - \sin A \sin 45^\circ] & \\ &= \sqrt{\frac{1}{17}} - \left[\left(-\frac{3}{5} \right) \left(\frac{\sqrt{2}}{2} \right) - \frac{4}{5} \left(\frac{\sqrt{2}}{2} \right) \right] \\ &= \sqrt{\frac{1}{17}} - \left(\frac{-7\sqrt{2}}{10} \right) \\ &= \frac{\sqrt{17}}{17} + \frac{7\sqrt{2}}{10}\end{aligned}$$

Uji Diri 6

$$\begin{aligned}\text{1 (a) } 2 \sin x &= \cos(x+60^\circ) \\ 2 \sin x &= \cos x \cos 60^\circ - \sin x \sin 60^\circ \\ 2 \sin x &= \frac{1}{2} \cos x - \frac{\sqrt{3}}{2} \sin x \\ \left(2 + \frac{\sqrt{3}}{2} \right) \sin x &= \frac{1}{2} \cos x \\ \frac{\sin x}{\cos x} &= 0.1745 \\ \tan x &= 0.1745 \\ x &= 9.9^\circ, 189.9^\circ\end{aligned}$$

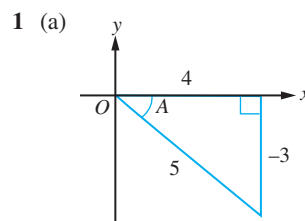
$$\begin{aligned}\text{(b) } 3 \sec^2 x &= 5(1 + \tan x) \\ 3(1 + \tan^2 x) &= 5 + 5 \tan x \\ 3 + 3 \tan^2 x &= 5 + 5 \tan x \\ 3 \tan^2 x - 5 \tan x - 2 &= 0 \\ (3 \tan x + 1)(\tan x - 2) &= 0 \\ \tan x &= -\frac{1}{2}, \quad \tan x = 2 \\ x &= 63.4^\circ, 161.57^\circ, 243.4^\circ, 341.57^\circ\end{aligned}$$

$$\begin{aligned}\text{2 (a) } 5 \cos x + 3 \sin x &= 0 \\ 3 \sin x &= -5 \cos x \\ \frac{\sin x}{\cos x} &= -\frac{5}{3} \\ \tan x &= -\frac{5}{3} \\ \text{(Sukuan II dan IV)} & \\ x &= 120.96^\circ, 300.96^\circ \\ \text{(b) } 2 \cos^2 x - 3 \cos x + 1 &= 0 \\ (2 \cos x - 1)(\cos x - 1) &= 0 \\ \cos x &= \frac{1}{2}, \cos x = 1 \\ x &= 0^\circ, 60^\circ, 300^\circ, 360^\circ \\ \text{(c) } \sec 2x &= -2.5896 \\ \frac{1}{\cos 2x} &= -2.5896 \\ \cos 2x &= -0.3862 \\ \text{(Sukuan II dan III)} & \\ 2x &= 112.72^\circ, 247.28^\circ, 472.72^\circ, 607.28^\circ \\ x &= 56.36^\circ, 123.64^\circ, 236.36^\circ, 303.64^\circ\end{aligned}$$

$$\begin{aligned}\text{3 (a) } 2 \csc^2 x + \cot x - 8 &= 0 \\ 2(\cot^2 x + 1) + \cot x - 8 &= 0 \\ 2 \cot^2 x + \cot x - 6 &= 0 \\ (2 \cot x - 3)(\cot x + 2) &= 0 \\ \cot x &= \frac{3}{2}, \quad \cot x = -2 \\ \tan x &= \frac{2}{3}, \quad \tan x = -\frac{1}{2} \\ x &= 33.69^\circ, 153.43^\circ, 213.69^\circ, 333.43^\circ \\ \text{(b) } 2 \cos 2x + 3 \sin x - 2 &= 0 \\ 2(1 - 2 \sin^2 x) + 3 \sin x - 2 &= 0 \\ 2 - 4 \sin^2 x + 3 \sin x - 2 &= 0 \\ 4 \sin^2 x - \sin x &= 0 \\ \sin x (4 \sin x - 3) &= 0 \\ \sin x &= 0, \sin x = \frac{3}{4} \\ x &= 0^\circ, 48.6^\circ, 131.4^\circ, 180^\circ, 360^\circ\end{aligned}$$

Praktis SPM

Kertas 1



$$\begin{aligned}\sin 2A &= 2 \sin A \cos A \\ &= 2 \left(-\frac{3}{5} \right) \left(\frac{4}{5} \right) \\ &= -\frac{24}{25}\end{aligned}$$