

QUIZ # 4 (A)

1) $f(x) = -3\sin(2x) + 3\sqrt{3}\cos(2x)$

$= k \sin(2x + \alpha)$

Find

a) The amplitude

$k = \sqrt{a^2 + b^2} = \sqrt{(-3)^2 + (3\sqrt{3})^2} = \sqrt{9 + 9 \cdot 3} = \sqrt{36} = 6$

b) The smallest positive phase shift

$\cos \alpha = \frac{-3}{6} = -\frac{1}{2} < 0$

$\sin \alpha = \frac{3\sqrt{3}}{6} = \frac{\sqrt{3}}{2} > 0$

$\Rightarrow \alpha \in Q II$
 $\alpha \leq \frac{\pi}{3} \Rightarrow \alpha = \frac{2\pi}{3} \text{ or } -\frac{4\pi}{3}$

PS = $-\frac{c}{b} = -\frac{2\pi}{3} = -\frac{\pi}{3}$

or $-\left(\frac{-4\pi}{3}\right) = \boxed{\frac{2\pi}{3}}$

2) Evaluate

a) $\sin\left(\sin^{-1}\left(\frac{\pi}{4}\right)\right) = \frac{\pi}{4}$

b) $\cos\left(\cos^{-1}\left(-\frac{2}{3}\right)\right) = -\frac{2}{3}$

c) $\sin^{-1}\left(\sin\frac{5\pi}{6}\right) = \theta' = \frac{\pi}{6}$
 \downarrow
 $II \rightarrow \sin \oplus$

d) $\cos^{-1}\left(\cos\frac{9\pi}{5}\right) = \frac{\pi}{5}$
 \downarrow
 $IV \rightarrow \cos \oplus$

e) $\csc\left(\tan^{-1}\left(-\frac{4}{3}\right)\right) = \csc \theta = \frac{r}{y} = \frac{5}{-4} = \boxed{-\frac{5}{4}}$

$\theta \in Q IV$ & $\tan \theta = -\frac{4}{3} = \frac{y}{x}$

