MATH 12 CH.9 RE – SOLUTIONS

(52) $2\sin 3x - \sqrt{3} = 0$ $2\sin 3x = \sqrt{3}$ $\sin 3x = \frac{\sqrt{3}}{2}$ $\theta^* = \frac{\pi}{3}$ AND $\sin\theta > 0$ IN QUAD. I AND II

$3x = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{7\pi}{3}, \frac{8\pi}{3}, \frac{13\pi}{3}, \frac{14\pi}{3}$ ($\pi - \frac{\pi}{3}$; ADD 2π) ⟸ ($0 \le x < 2\pi$, so $0 \le 3x < 6\pi$)

$x = \boxed{\frac{\pi}{9}, \frac{2\pi}{9}, \frac{7\pi}{9}, \frac{8\pi}{9}, \frac{13\pi}{9}, \frac{14\pi}{9}}$

(53) $\sin x - \cos 2x + 1 = 0$

$\sin x - (1 - 2\sin^2 x) + 1 = 0$

$2\sin^2 x + \sin x = 0$

$(\sin x)(2\sin x + 1) = 0$

1) $\sin x = 0$ OR 2) $\sin x = -\frac{1}{2}$

1) IF $\sin x = 0$, $\boxed{x = 0}$ OR $\boxed{x = \pi}$ (since $0 \le x < 2\pi$)

2) IF $\sin x = -\frac{1}{2}$, $\theta^* = \frac{\pi}{6}$ AND $\sin\theta < 0$ IN QUAD. III AND IV; SO

$\boxed{x = \frac{7\pi}{6}}$ ($\pi + \frac{\pi}{6}$) OR $\boxed{x = \frac{11\pi}{6}}$ ($2\pi - \frac{\pi}{6}$)

(54) $\sin x + \sin 2x = 0$

$\sin x + 2\sin x \cos x = 0$

$(\sin x)(1 + 2\cos x) = 0$

1) $\sin x = 0$ OR 2) $\cos x = -\frac{1}{2}$

1) IF $\sin x = 0$, $\boxed{x = 0}$ OR $\boxed{x = \pi}$ (since $0 \le x < 2\pi$)

2) IF $\cos x = -\frac{1}{2}$, $\theta^* = \frac{\pi}{3}$ AND $\cos\theta < 0$ IN QUAD. II AND III; SO

$\boxed{x = \frac{2\pi}{3}}$ ($\pi - \frac{\pi}{3}$) OR $\boxed{x = \frac{4\pi}{3}}$ ($\pi + \frac{\pi}{3}$)

(56) $2\sin^2 x + \sin x - 1 = 0$

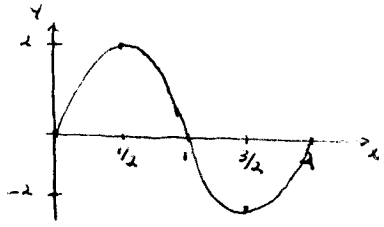
$(2\sin x - 1)(\sin x + 1) = 0$

1) $\sin x = \frac{1}{2}$ OR 2) $\sin x = -1$

1) IF $\sin x = \frac{1}{2}$, $\theta^* = \frac{\pi}{6}$ AND $\sin\theta > 0$ IN QUAD. I AND II; SO $\boxed{x = \frac{\pi}{6}}$ OR $\boxed{x = \frac{5\pi}{6}}$ ($\pi - \frac{\pi}{6}$)

2) IF $\sin x = -1$, $\boxed{x = \frac{3\pi}{2}}$

8.3 – (69) $y = 2\sin \pi x$ AMPLITUDE = 2 PERIOD = $\frac{2\pi}{\pi} = \frac{2\pi}{\pi} = 2$



X-INTERCEPTS : 0, 1, 2 (on $[0, 2]$)

INCREASING on $(0, \frac{1}{2})$ AND on $(\frac{3}{2}, 2)$