King Fahd University of Petroleum and Minerals

Prep-Year Math Program

Math 002 - Term 132

Recitation (7.6 and 7.7)

Question 1: The number of solutions of the equation $\sin 2x = \cos 2x + 1$ over the interval $[0°, 360°)$ is

A) 3 B) 4 C) 5 D) 6 E) 8

Answer: (B): 4: $SS = \left\{\frac{\pi}{4}, \frac{\pi}{2}, \frac{5\pi}{4}, \frac{3\pi}{2}\right\}$

Question 2: Solve the following equations

(a): $\tan^2 x - 3\sec x + 3 = 0$, for $0 \le x \le \pi$.

(b): $\sin 2x + \sin x - 2\cos x - 1 = 0$ where $0 \le x < 2\pi$

(c): $\tan\frac{x}{2} = 1 - \cos x$ where $0 \le x < 2\pi$.

(a):Answer: $SS = \left\{0, \frac{\pi}{3}\right\}$

(b): Answer: $SS = \left\{\frac{\pi}{2}, \frac{2\pi}{3}, \frac{4\pi}{3}\right\}$

(c): Answer: $SS = \left\{0, \frac{\pi}{2}\right\}$

Question 3: Solve the equation: $\arcsin 2x + \arccos x = \frac{\pi}{6}$ **Answer:** $SS = \left\{-\frac{1}{2}\right\}$

Question 4: The sum of all solutions of the equation $-2\cos 2x \sin 3x + 2\cos 3x \sin 2x = \sqrt{3}$ in the interval $[-\pi, \pi]$ is:

A) $-\frac{4\pi}{3}$ B) $-\frac{2\pi}{3}$ C) $\frac{\pi}{3}$

D) $-\pi$ E) $\frac{2\pi}{3}$

Answer: $-\pi$

Question 5: If $\cos^{-1} x - \tan^{-1}\sqrt{3} = \sin^{-1}\frac{1}{3}$, then $x =$

A) $\frac{2\sqrt{2} + \sqrt{3}}{6}$ B) $\frac{2\sqrt{2} + 1}{6}$ C) $\frac{4 + \sqrt{2}}{6}$

D) $\frac{2\sqrt{2} - 1}{6}$ E) $\frac{2\sqrt{2} - \sqrt{3}}{6}$