

King Fahd University of Petroleum and Minerals

Prep-Year Math Program

Math 002 - Term 142

Recitation (7.6 and 7.7)

Question 1: Solve the following equations

a) $\sin \frac{x}{2} + \cos x = 1$, for $0 \leq x \leq \pi$.

b) $\sin 2x + \sin x - 2 \cos x - 1 = 0$, where $0 \leq x < 2\pi$

c) $\tan \frac{x}{2} = 1 - \cos x$, where $0 \leq x < 2\pi$.

Answer: (a): $SS = \left\{0, \frac{\pi}{3}\right\}$ (b): $SS = \left\{\frac{\pi}{2}, \frac{2\pi}{3}, \frac{4\pi}{3}\right\}$ (c): $SS = \left\{0, \frac{\pi}{2}\right\}$

Question 2: Solve the equations: $\arcsin 2x + \arccos x = \frac{\pi}{2}$ **Answer:** $SS = \{0\}$

Question 3

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) $\frac{2\pi}{3}$

Question 4: 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) $\frac{2\sqrt{2} - \sqrt{3}}{6}$