Classroom Voting Questions: Precalculus

Solving Trigonometric Equations

1. For \( \theta \) in the interval \([0, 2\pi)\), find all solutions of the equation \( \sin \theta = \frac{1}{2} \).

   (a) \( \theta = \frac{\pi}{6} \)

   (b) \( \theta = \frac{\pi}{6} \) and \( \theta = \frac{5\pi}{6} \)

   (c) \( \theta = \frac{\pi}{6}, \theta = \frac{5\pi}{6}, \theta = \frac{7\pi}{6}, \) and \( \theta = \frac{11\pi}{6} \)

   (d) None of the above

2. Solve the equation \( \tan \theta = 1 \).

   (a) \( \theta = \frac{\pi}{4} \)

   (b) \( \theta = \frac{\pi}{4} \) and \( \theta = \frac{5\pi}{4} \)

   (c) \( \theta = \frac{\pi}{4} + 2\pi n \), where \( n \) is any integer

   (d) \( \theta = \frac{5\pi}{4} + \pi n \), where \( n \) is any integer

3. Solve the equation \( \sin \theta \tan \theta = \tan \theta \).

   (a) \( \theta = \frac{\pi}{2} + 2\pi n \), where \( n \) is any integer

   (b) \( \theta = \frac{\pi}{2} + 2\pi n \) and \( 2\pi n \), where \( n \) is any integer

   (c) \( \theta = \frac{\pi}{2} + 2\pi n \) and \( \pi n \), where \( n \) is any integer

   (d) \( \pi n \), where \( n \) is any integer