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KNOW /12 APP /12 INQ /12 COMM /6

## MHF4U1 - UNIT 7 - TRIGONOMETRIC IDENTITIES AND EQUATIONS TEST

- 1. Express  $\frac{2\tan\left(\frac{\theta}{2}\right)}{1-\tan^2\left(\frac{\theta}{2}\right)}$  as a **single** trigonometric function. Simplify as much as possible. (K-2 marks)
- 2. Simplify  $\sin\left(\frac{\pi}{2} x\right) + \sin(\pi + x) + \sin\left(\frac{3\pi}{2} + x\right) + \sin(2\pi x)$ . (K 3 marks)

3. Determine the exact value of the trigonometric ratio  $\sin \frac{5\pi}{12}$ . Rationalize the denominator. (*K* - 3 marks)

4. If  $\tan x = -\frac{3}{4}$  and  $\frac{3\pi}{2} \le x \le 2\pi$ , determine the exact value of  $\sin 4x$ . (K - 4 marks)

5. Determine the solutions for each equation on the interval  $0 \le x \le 2\pi$ . Give exact solutions, where possible. Round approximate solutions to the nearest hundredth of a radian. (*A* - 3 marks each)

$$a) - 5\cos x + 3 = 2$$

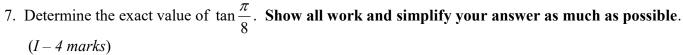
b) 
$$2\sin 3x + \sqrt{3} = 0$$

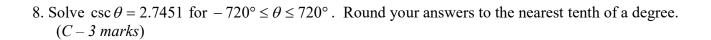
c) 
$$\sin x + \sin x \tan x = 0$$

d) 
$$\cos 2x - 3 = 5\cos x - 4\cos^2 x$$

a) 
$$\frac{\sin 2x + \sin x}{1 + \cos x + \cos 2x} = \cot \left(\frac{\pi}{2} - x\right)$$

b) 
$$(\sec x - \cos x)(\csc x - \sin x) = \frac{\tan x}{1 + \tan^2 x}$$





9. Using other identities, develop the tangent subtraction formula  $\tan(x-y) = \frac{\tan x - \tan y}{1 + \tan x \tan y}$ . (*C* - 3 marks)