MHF 4UI - EXAM REVIEW

Chapter 6 - Trigonometry Part II

Trig Equations and Identities:

** Note: You will be GIVEN the identities that you were given on the test:

Trigonometry (II) FORMULA SHEET

Pythagorean Identities

$$\sin^2 x + \cos^2 x = 1$$

$$1 + \tan^2 x = \sec^2 x$$

$$1 + \cot^2 x = \csc^2 x$$

Addition and Subtraction Formulas

$$\sin(x+y) = \sin x \cos y + \cos x \sin y$$

$$\sin(x-y) = \sin x \cos y - \cos x \sin y$$

$$\cos(x+y) = \cos x \cos y - \sin x \sin y$$

$$\cos(x-y) = \cos x \cos y + \sin x \sin y$$

$$\tan(x+y) = \frac{\tan x + \tan y}{1 - \tan x \tan y}$$

$$\tan(x-y) = \frac{\tan x - \tan y}{1 + \tan x \tan y}$$

Double Angle Formulas

$$\sin 2x = 2 \sin x \cos x$$

$$\begin{aligned} \cos 2x &= 2\cos^2 x - 1 \\ &= 1 - 2\sin^2 x \\ &= \cos^2 x - \sin^2 x \end{aligned}$$

$$\tan 2x = \frac{2\tan x}{1 - \tan^2 x}$$

Examples: Prove the following:

$$\tan x - \cot x = (\tan x - 1)(\cot x + 1)$$

$$\frac{\sin 2x}{1 + \cos 2x} = \tan x$$

Solve the following Trig Equations: $0 \leq x \leq 2\pi$

$\cos x = \frac{-\sqrt{3}}{2}$

$2\cos^2 x + \cos x - 1 = 0$

Find the exact value of $\sin\frac{7\pi}{12}$