

[11-12-27-T11]

Notes Trimester 2 Exam 1

This exam covers material introduced since the Nov 15, 2011 (Week 12 in the homework section of www.math.mart.net) up to, but not including, complex numbers. This material includes the following.

■ **Calculators will not be allowed. Notes, including the sheet of basic identities) will not be allowed.**

■ **General sine function**

The function $f(x) = A \sin k(x - \beta)$. Find the value of the constants. Know the effect each constant has on the function and on the function's graph. Find the values of the constants, given the graph of a function. Know and use the fact that $kT = 2\pi$, for the sine and cosine functions, where T is the period of the function f .

■ **Graphs of the six trigonometric functions**

■ **Proof**

Prove identities including any of those on the sheet of basic identities.

You will not be required to give a geometric proof of an addition theorem, but you may be asked to prove one of the addition theorems, given some other one. For example, "Assuming $\cos(x + y) = \cos x \cos y - \sin x \sin y$, show that $\sin(x - y) = \sin x \cos y - \sin y \cos x$."

■ **Values of trigonometric functions**

Find the exact value of a trigonometric function at x , where the use of identities (particularly of those based on the addition theorems) will be required. Example: to find the $\cos \frac{\pi}{12}$, one must realize that

$\frac{\pi}{12} = \frac{\pi}{3} - \frac{\pi}{4}$, so that

$$\cos \frac{\pi}{12} = \cos\left(\frac{\pi}{3} - \frac{\pi}{4}\right) = \cos \frac{\pi}{3} \cos \frac{\pi}{4} + \sin \frac{\pi}{3} \sin \frac{\pi}{4} = \frac{1}{2} \cdot \frac{\sqrt{2}}{2} + \frac{\sqrt{3}}{2} \cdot \frac{\sqrt{2}}{2} = \frac{\sqrt{2} + \sqrt{6}}{4}.$$

■ **Solve equations involving trigonometric functions**

Be prepared to provide all solutions and solutions within a given interval such as $[0, 2\pi)$. Expect to solve equations that require the use of identities.