

REVIEW TEST #2

Chapters 4, 5, and 6



Test #2 will be
Wednesday, May 7

You should know the following:

- how to graph the basic functions sin, cos, tan, cot, sec, csc
- domain, range, period, amplitude (when defined) and vertical asymptotes (when applicable) for the basic functions
- how to graph transformations of trigonometric functions (vertical translations, vertical stretching and compression, horizontal stretching and compression, horizontal shifting)
- how to graph the inverse sine, inverse cosine, and inverse tangent functions
- domain and range for the inverse functions
- evaluate the inverse sine, cosine, and tangent functions
- compose trigonometric functions and their inverses
- prove trigonometric identities
- solve trigonometric equations
- finding an equation from its graph
- graphing combinations of functions

IMPORTANT FORMULAS

- $\tan x = \frac{\sin x}{\cos x}$
- $\cot x = \frac{1}{\tan x} = \frac{\cos x}{\sin x}$
- $\sec x = \frac{1}{\cos x}$
- $\csc x = \frac{1}{\sin x}$
- $\sin^2 x + \cos^2 x = 1$
- sine and cosine functions have period $2\mathbf{p}$

$$\sin(x + 2k\mathbf{p}) = \sin x$$

$$\cos(x + 2k\mathbf{p}) = \cos x$$
- tangent function has period \mathbf{p}

$$\tan(x + k\mathbf{p}) = \tan x$$
- $\cos(a + b) = \cos a \cos b - \sin a \sin b$
- $\cos(a - b) = \cos a \cos b + \sin a \sin b$
- $\sin(a + b) = \sin a \cos b + \sin b \cos a$
- $\sin(a - b) = \sin a \cos b - \sin b \cos a$
- $\cos 2a = \cos^2 a - \sin^2 a$
- $\cos 2a = 2\cos^2 a - 1$
- $\cos 2a = 1 - 2\sin^2 a$
- $\sin 2a = 2\sin a \cos a$

OTHER FORMULAS

$$\sin(x + \mathbf{p}) = -\sin x$$

$$\cos(x + \mathbf{p}) = -\cos x$$

$$\cos(-x) = \cos x \quad \text{cosine is an even function}$$

$$\sin(-x) = -\sin x \quad \text{sine is an odd function}$$

$$\tan(a + b) = \frac{\tan a + \tan b}{1 - \tan a \tan b}$$

$$\tan(a - b) = \frac{\tan a - \tan b}{1 + \tan a \tan b}$$

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

$$\cos a = \pm \sqrt{\frac{1 + \cos 2a}{2}}$$

$$\sin a = \pm \sqrt{\frac{1 - \cos 2a}{2}}$$

To prepare for the test, study the following:

All problems done in class + Quiz #2

Homework #3, #4, #5	Section 4.1	7, 8, 11 – 24 , 51, 53, 55, 57
	Section 4.2	1, 4, 7, 13, 17, 20, 21, 23, 30, 33 – 36, 41, 42, 44, 46, 47, 48
	Section 4.3	1, 4, 7, 10, 11, 14, 15, 18, 19, 29, 33, 34 37, 47, 49
	Section 4.4	all
	Section 4.5	7, 13, 20, 23, 24
	Section 4.6	all
	Section 5.1	all
	Section 5.2	1 – 7 odd, 21 – 29 odd, 53, 55
	Section 5.3	all
	Section 5.5	1, 3, 5, 7, 9, 11
	Section 6.1 – 6.3	all

- 1) Find a formula for $\tan(a+b)$ and $\tan(a-b)$ in terms of $\tan a$ and $\tan b$.
- 2) Find a formula for $\sin 3a$ in terms of $\sin a$.
- 3) Find a formula for $\cos 3a$ in terms of $\cos a$.
- 4) Express each of the following in terms of x : $\cos(\sin^{-1} x)$, $\sin(\cos^{-1} x)$, $\cos(\tan^{-1} x)$, $\sin(\tan^{-1} x)$, $\tan(\cos^{-1} x)$, $\tan(\sin^{-1} x)$.