Chapter 5 Analytic Trigonometry

QW: What does analytic mean?

an·a·lyt·ic

[anəˈlidik] (1))

ADJECTIVE

- 1. another term for analytical.
 - logic true by virtue of the meaning of the words or concepts used to express it, so that its denial would be a self-contradiction. Compare with synthetic.
 - linguistics
 (of a language) tending not to alter the form of its words and to use word order rather than inflection or agglutination to express grammatical structure. Often contrasted with synthetic.

On a notecard, you need to copy down all the trigonometric identities for sections:

5.1

5.4

5.5

(Also in Chapter summary)

You will use this notecard throughout the chapter. Since some will have to be memorized, we will make a new one for the test.

Reciprocal Identities

$$\sin u = \frac{1}{\csc u}$$
 $\cos u = \frac{1}{\sec u}$ $\tan u = \frac{1}{\cot u}$

$$\cos u = \frac{1}{\sec u}$$

$$\tan u = \frac{1}{\cot u}$$

$$\csc u = \frac{1}{\sin u}$$

$$\sec u = \frac{1}{\cos u}$$

$$\csc u = \frac{1}{\sin u}$$
 $\sec u = \frac{1}{\cos u}$
 $\cot u = \frac{1}{\tan u}$

Quotient Identities

$$\tan u = \frac{\sin u}{\cos u} \qquad \cot u = \frac{\cos u}{\sin u}$$

*****Pythagorean Identities*****

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

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

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

Cofunction Identities

$$\sin\left(\frac{\pi}{2}-u\right) = \cos u$$

$$\cos\left(\frac{\pi}{2} - u\right) = \sin u$$

$$\tan\left(\frac{\pi}{2}-u\right) = \cot u$$

$$\cot\left(\frac{\pi}{2}-u\right)=\tan u$$

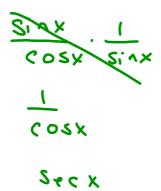
$$\sec\left(\frac{\pi}{2}-u\right)=\csc u$$

$$\csc\left(\frac{\pi}{2}-u\right) = \sec u$$

Even/Odd Identities

$$\sin(-u) = -\sin u \quad \cos(-u) = \cos u \quad \tan(-u) = -\tan u$$
$$\csc(-u) = -\csc u \quad \sec(-u) = \sec u \quad \cot(-u) = -\cot u$$

 $\tan x \csc x$



$$\cos^{2} x \left(\sec^{2} x - 1 \right)$$

$$\cos^{2} x \left(\frac{\sin^{2} x}{\cos^{2} x} \right)$$

$$\sin^{2} x$$

$$\sin^{2} x$$

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

$$\sin x \cos^2 x - \sin x$$

$$\sin x (\cos^2 x - 1)$$

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

$$\cos^2 u - 1 = -\sin^2 u$$

$$\sec^2 x \left(1 - \sin^2 x\right)$$

$$\frac{\sin^2 x \left(\cos^2 x\right)}{\cos^2 x}$$

Factor

a.
$$4 \tan^2 \theta + \tan \theta - 3$$

b.
$$1-\cos^2 x$$

c.
$$2\csc^2\theta - 7\csc\theta + 6$$

d.
$$\sec^2 x + 3\tan x + 1$$
 $1 + \tan^2 u = \sec^2 u$

a.
$$4 \tan^2 \theta + |\tan \theta - 3|$$
 $(4 \tan^2 \theta + |\tan \theta - 3|)$ $(4$

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

Simplify:
$$\frac{\csc^2 x - 1}{\csc x - 1}$$
 (csc x + 1)

Rewrite
$$\frac{\cos^2 y}{1-\sin y}$$
 so that it is not in fractional form

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

Use the substitution $x=5\sin\theta$, $0<\theta<\frac{\pi}{2}$ to write $\sqrt{25-x^2}$ as a trigonometric function of θ

Summarize the major points of the lesson

Essential Question: How do you rewrite trigonometric expressions in order to simplify and evaluate trigonometric functions?

5.1hpc.notebook February 10, 2020