PC 12 Session 18

March 9, 2022 2:00 PM

Pre-Calculus 12 Session 18
Thursday, March 10, 2022

1. Last Day's Homework:
   - Textbook Practice: Section 5.3: pages 262 to 265, Practise 1a), c), 2a), c), e), 3, 7, 8
   - Readings: Section 6.1 (pages 290 to 296), Section 6.2 (pages 300 to 305), Section 6.3 (pages 309 to 313), Section 6.4 (pages 316 to 320).
   - Hand-in Assignments and other things: The Chapter 5 Hand-in Assignment will be due on Tuesday, March 29.

2. ~~Return of, and Comments on, the Chapter 4 Hand-in Assignment~~

3. More about Section 5.4: Equations and Graphs of Trig Functions (a.k.a. solving Trig Equations by Graphing and Applications of Trig Functions)

4. Section 6.1: Reciprocal, Quotient and Pythagorean Identities

5. Section 6.2: Sum, Difference and Double Angle Identities

Section 6.3 Proving identities

Homework: This depends on how far we get today.

Readings: Section 6.1 (pages 290 to 296), Section 6.2 (pages 300 to 305), Section 6.3 (pages 309 to 313), Section 6.4 (pages 316 to 320).

Practice from Textbook to try:

~~Section 5.3: pages 262 to 265, Practise 1a), c), 2a), c), e), 3, 7, 8~~
Section 5.4: pages 275-279, Practise 1, 2, 3, 4a), c), 5a), c), 6, 8b), 9, 10, 14, 16, 19.
The Chapter 5 Review (pages 282-285), the Chapter 5 Practice Test (pages 286 and 287).
Section 6.1: pages 296-298, Practise 1a), c), 3, 4, 5, 6, 10, 11, 14, 15, 16.
~~Section 6.2: pages 305-308, Practise 1a), d), e), 2a), c), 4a), c), e), 8a), c), e), 9, 10, 11a), b), 16, 17, 19a), 20a), c).~~
~~Section 6.3: pages 314-s315, Practise 1a), b), 2b), d), 3a), e), 5, 7, 8, 10b), c) 11a), c), 12a), 15, 18.~~

Hand-in Assignments: You should be working on the Chapter 5 Hand-in Assignment. That assignment will likely be due on Tuesday, March 29. You should also begin working on the Chapter 6 Hand-in Assignment.

There are no classes on Tuesday, March 15, Thursday, March 17, Tuesday, March 22 and Thursday, March 24.

The Chapter 5 Test will be on Thursday, March 31.

End of last time: modelling real-life situations with trig functions

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Trig Identities

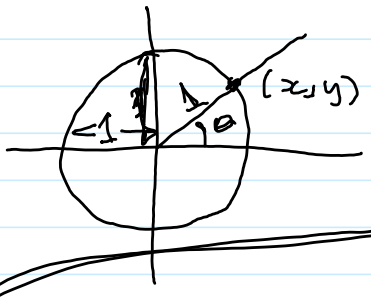
The Reciprocal Identities

$\csc\theta = \frac{1}{\sin\theta}$ $\quad \sin\theta = \frac{1}{\csc\theta}$

$\sec\theta = \frac{1}{\cos\theta}$ $\quad \cos\theta = \frac{1}{\sec\theta}$

$\cot\theta = \frac{1}{\tan\theta}$ $\quad \tan\theta = \frac{1}{\cot\theta}$

The Pythagorean Identities



$x^2 + y^2 = 1 \quad x = \cos\theta \quad y = \sin\theta$

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

$\boxed{\sin^2\theta + \cos^2\theta = 1}$

To get the other ones, we need to look at the Quotient identities.

$\boxed{\tan\theta = \frac{\sin\theta}{\cos\theta}}$ $\quad \cot\theta = \frac{\cos\theta}{\sin\theta}$.

$\cot^2\theta = \left(\frac{\cos\theta}{\sin\theta}\right)^2$

$\frac{\sin^2\theta}{\cos^2\theta} + \frac{\cos^2\theta}{\cos^2\theta} = \frac{1}{\cos^2\theta}$

$\left(\frac{\sin\theta}{\cos\theta}\right)^2 + 1 = \left(\frac{1}{\cos\theta}\right)^2$

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

$\boxed{1 + \tan^2\theta = \sec^2\theta}$ $\quad \tan^2\theta = \sec^2\theta - 1$

$\sec^2\theta - \tan^2\theta = 1.$

$\frac{\sin^2\theta}{\sin^2\theta} + \frac{\cos^2\theta}{\sin^2\theta} = \frac{1}{\sin^2\theta}$

$\boxed{1 + \cot^2\theta = \csc^2\theta}$ $\quad \cot^2\theta = \csc^2\theta - 1$

$1 = \csc^2\theta - \cot^2\theta$

$\sin^2\theta \quad \sin\theta \quad \sin^{-1}\theta$

$1 + \cot^2\theta = \csc^2\theta$ ← $1 = \csc^2\theta - \cot^2\theta$

→ $\sin^2\theta + \cos^2\theta = 1$ $\quad \sin^2\theta = 1 - \cos^2\theta$

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

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