

PC 12 Session 19

Sunday, March 27, 2022 5:00 PM

The page contains a series of horizontal blue lines for writing, spaced evenly down the page. A vertical red line is positioned on the left side, creating a margin. The lines are intended for taking notes during the session.

Pre-Calculus 12 Session 19
Tuesday, March 29, 2022

1. Last Day's Homework:

- Textbook Practice: 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.
- 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 is due today.

2. A look and the Unit 5 Hand-in Assignment

3. A look back at Section 6.1: Reciprocal, Quotient and Pythagorean Identities

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

5. Section 6.3: Proving Identities

6. Section 6.4: Solving Trigonometric Equations Using Identities

Homework: This depends on how far we get today.

Readings: Section 7.1 (pages 334 to 342), Section 7.2 (pages 346 to 354), Section 7.3 (pages 358 to 363).

Practice from Textbook to try:

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. (if you haven't already done so)

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 314-315, Practise 1a), b), 2b), d), 3a), c), 5, 7, 8, 10b), c) 11a), c), 12a), 15, 18.

~~Section 6.4: pages 320-321, Practise 1b), c), 2b), c), 3a), b), c), 4, 5, 6, 10, 14, 17.~~

Hand-in Assignments: You should be working on the Chapter 6 Hand-in Assignment. That assignment will possibly be due on Tuesday, April 5.

The Chapter 5 Test will be next day.

The Chapter 6 Test will either be on Thursday, April 7, or (more likely) Tuesday, April 12.

A look back at Section 6.1 → Reciprocal, Quotient and Pythagorean identities

Section 6.2: Sum, Difference and Double-Angle identities

Sum identities

$$\sin(\alpha + \beta) = \sin \alpha \cos \beta + \cos \alpha \sin \beta$$

$$\sin(\alpha - \beta) = \sin \alpha \cos \beta - \cos \alpha \sin \beta$$

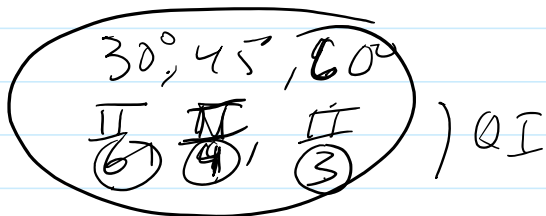
$$\cos(\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta$$

$$\cos(\alpha - \beta) = \cos \alpha \cos \beta + \sin \alpha \sin \beta$$

$$\tan(\alpha + \beta) = \frac{\tan \alpha + \tan \beta}{1 - \tan \alpha \tan \beta}$$

$$\tan(\alpha - \beta) = \frac{\tan \alpha - \tan \beta}{1 + \tan \alpha \tan \beta}$$

We can use these identities to determine the exact values of the sine, cosine & tangent of angles other than our "special angles" & the quadrant angles.

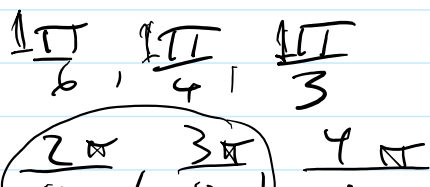


$0^\circ, 90^\circ, 180^\circ, 270^\circ, \dots$

$0, \frac{\pi}{2}, \pi, \frac{3\pi}{2}, 2\pi$

QII $120^\circ, 135^\circ, 150^\circ$
etc

$0, \frac{6\pi}{12}, \frac{12\pi}{12}, \frac{18\pi}{12}, \frac{24\pi}{12}$



$$\frac{2\pi}{12}, \frac{3\pi}{12}, \frac{4\pi}{12}$$

Double angle identities

$$\sin(\alpha + \beta) = \sin\alpha \cos\beta + \cos\alpha \sin\beta \quad \text{if } \alpha = \beta = \theta$$

$$\sin(2\theta) = \sin\theta \cos\theta + \cos\theta \sin\theta$$

$$\sin 2\theta = 2\sin\theta \cos\theta$$

$$\begin{aligned} \sin 60^\circ &= \sin(2 \times 30^\circ) = 2\sin 30^\circ \cos 30^\circ \\ &= 2 \cdot \left(\frac{1}{2}\right) \left(\frac{\sqrt{3}}{2}\right) = \frac{2\sqrt{3}}{2 \times 2} = \frac{\sqrt{3}}{2} \end{aligned}$$

$$\cos(\alpha + \beta) = \cos\alpha \cos\beta - \sin\alpha \sin\beta \quad \text{if } \alpha = \beta = \theta$$

$$\cos(2\theta) = \cos\theta \cos\theta - \sin\theta \sin\theta$$

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

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

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

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

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

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

$$\cos 2\theta = \cos^2\theta - (1 - \cos^2\theta) = 2\cos^2\theta - 1$$

$$\tan 2\theta = \frac{\tan\theta + \tan\theta}{1 - \tan\theta \tan\theta} = \frac{2\tan\theta}{1 - \tan^2\theta}$$