PC 12 Session 11

February 14, 2022 11:35 AM

Pre-Calculus 12 Session 11
Tuesday, February 15, 2022

1. Last Day's Homework:
   - Practice: Section 3.4: pages 147-150, Practise 1, 2a, c, e, 4a, c, 5, 7, 8a, c, 9a, c, e, 10a, c, 11, 14, 16. Section 4.1: pages 175-176, Practise 1, 2a), c), e), 4a), c), e), 6a), c), e), 7a), c), e), 8a), c), 9a), b), 12a), c), 13.
   - Readings: Nothing new.
   - Hand-in Assignments and other things: The Chapter 3 Hand-in Assignment is due in TODAY. The Chapter 3 Test will be on Tuesday, February 15.

1a: return of Ch3 Assts w/some comments.

2. More about Section 4.2: The Unit Circle

3. Section 4.3: Trigonometric Ratios

4. Section 4.4: Introduction to Trigonometric Equations

5. The Chapter 3 Test

Homework: This depends on how far we get today.

Readings: Nothing new.

Practice from Textbook to try:

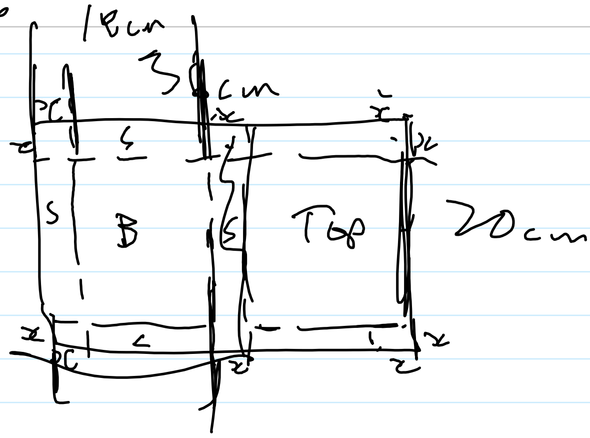
Section 4.2: pages 186-188, Practise 2a), c), e), 2a), c), e), 3a), c), 4a), c), e), h), i), 5a), c), e), 6, 7, 9, 13, 18.
Section 4.3: pages 201-203, Practise 1a), c), e), g), i), k), 2a), c), e), g), i), k), 3a), c), e), 6a), c), e), 9a), c), e), 10 (all parts), 11 (all parts), 12a), c).
Section 4.4: pages 211-213, Practise 1a), c), 2, 3a), c), 4a), c), 5a), c), e), 6a), c), e), 7 (all), 9, 13, 16.

Hand-in Assignments: You should begin working on the Chapter 4 Hand-in Assignment. That assignment will likely be due in on Tuesday, February 22.

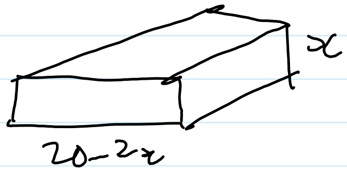
?? maybe Thursday, Feb 24.

p156

9



18 − x



$V(x) = x(20-2x)(18-x)$

$512 = x(20-2x)(18-x) = 512$

$512 = (20x - 2x^2)(18-x)$

$512 = 360x - 20x - 36x^2 + 2x^3$

$512 = 340x - 36x^2 + 2x^3 - 512$

-512

$0 = 2x^3 - 36x^2 + 340x - 512$ Factor

$0 = 2(x^3 - 18x^2 + 170x - 256)$

$/2$

poss integral zeros are factors of [illegible]

$x = 2$

$2 \times (20 - 2(2))(18 - 2)$

$2 \times 16 \times 16$
cm cm cm

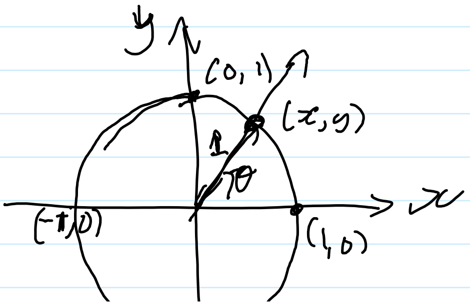
End of last time

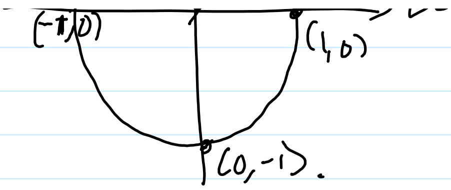
- Equations of Circles

The Unit Circle is a circle of radius = 1 unit.

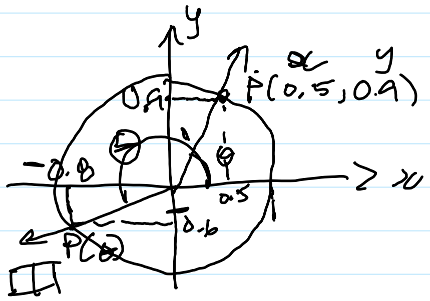
So, for any point (x, y) on the unit circle,

$x^2 + y^2 = 1$





For any angle θ, drawn in standard position, the coordinates of the point where the terminal arm of the angle intersects the unit circle gives us the cosine and the sine of the angle θ.



$\cos\theta = x = 0.5$
$\sin\theta = y = 0.9$

~~SOH CAH TOA~~

It does not matter ~~what~~ which quadrant the terminal arm of θ lies in.

If $P(\theta) = (-0.8, -0.6)$, then $\cos\theta = -0.8$
$\sin\theta = -0.6$.

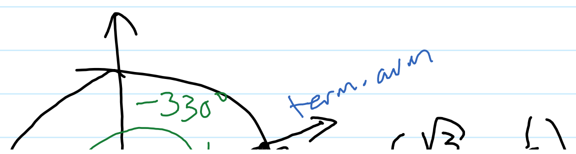
$\tan\theta = \frac{y}{x} = \frac{-0.6}{-0.8} = \frac{6}{8} = 3/4$
$= 0.75$.

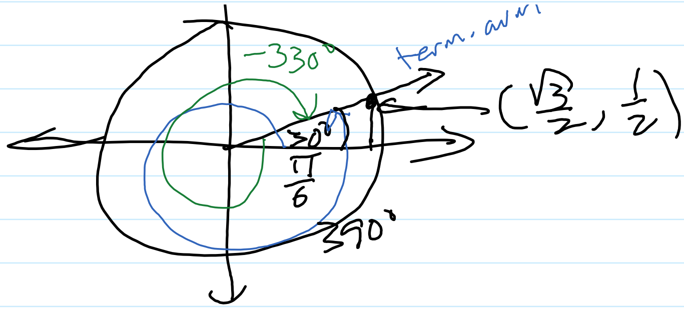
"Special" Triangle Angles

The Quadrantal angles ($0^\circ, 90^\circ, 180^\circ, 270^\circ, 360^\circ$, etc) (and all their co-terminal angles) are "special" because we can easily determine their sine, cosines, etc, using the Unit Circle.

The other "special angles" are 30°, 45° and 60° (and all angles coterminal with those angles and all angles having those angles as reference angles.

$\cos 30^\circ = \frac{\sqrt{3}}{2}$ $\left(\frac{\pi}{6}\right)$ $\sin 30^\circ = \frac{1}{2}$ $\left(\frac{\pi}{6}\right)$



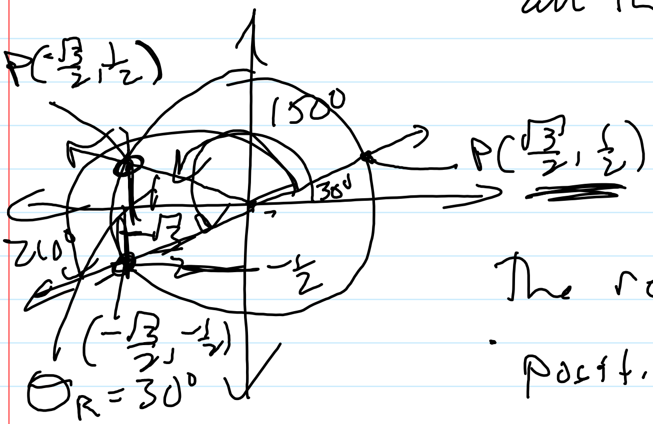


$\cos 390° = \frac{\sqrt{3}}{2}$ $\left(\frac{13\pi}{6}\right)$ $\quad \sin 390° = \frac{1}{2}$ $\left(\frac{13\pi}{6}\right)$

$\cos(-330°) = \frac{\sqrt{3}}{2}$ $\left(-\frac{11\pi}{6}\right)$ $\quad \sin(-330°) = \frac{1}{2}$ $\left(-\frac{11\pi}{6}\right)$

$$\cos\left(\overset{\frac{\pi}{6}}{30°}\right) = \cos(\underbrace{30° + 360°n}_{\text{all the coterminal angles of } 30°}),\ n \in I \qquad \left(\frac{\pi}{6} + 2\pi n\right)$$

$$\sin(30°) = \sin(\underbrace{30° + 360°n}_{\text{all the coterminal angles of } 30°}),\ n \in I \qquad \left(\frac{\pi}{6} + 2\pi n\right)$$



The reference of an angle is the positive measure of the angle between the terminal arm and the nearest x-axis.

$\cos 150° = -\cos 30° = -\frac{\sqrt{3}}{2}$

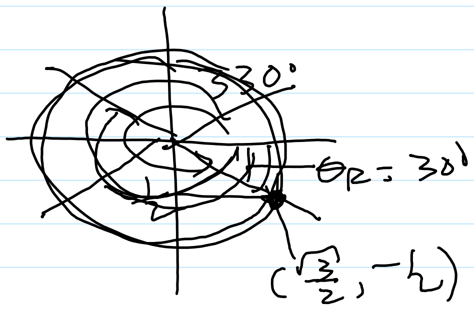
$\sin 150° = \sin 30° = \frac{1}{2}$

150° has $\theta_R = 30°$

$\cos 210° = -\cos 30° = -\frac{\sqrt{3}}{2}$

$\sin 210° = -\sin 30° = -\frac{\sqrt{3}}{2}$

210° has $\theta_R = 30°$



$\cos \overset{\frac{11\pi}{6}}{330°} = \frac{\sqrt{3}}{2} \quad \sin \overset{\frac{11\pi}{6}}{330°} = -\frac{1}{2}$