Pre-Calculus 12 Session 12
Thursday, February 17, 2022

1. Last Day's Homework:
   - Practice: 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.
   - Readings: Nothing new.
   - Hand-in Assignments and other things: The Chapter 4 Hand-in Assignment may possibly be due on ~~Tuesday, February 22~~, but only if we finish off Chapter 4 today which is really doubtful. *Thursday, Feb 24*   ∫

2. Return of, and Comments on, the Chapter 3 Test

3. Just a Little More about Section 4.2: The Unit Circle

4. Section 4.3: Trigonometric Ratios

→ 5. Section 4.4: Introduction to Trigonometric Equations

6. Section 5.2 Graphing Sine and Cosine Functions

Homework: This depends on how far we get today.

Readings: Section 5.1 pages 222 to 232, Section 5.2 pages 238 to 249, Section 5.3 pages 256 to 262.

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 (if you have not already tried them).
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).
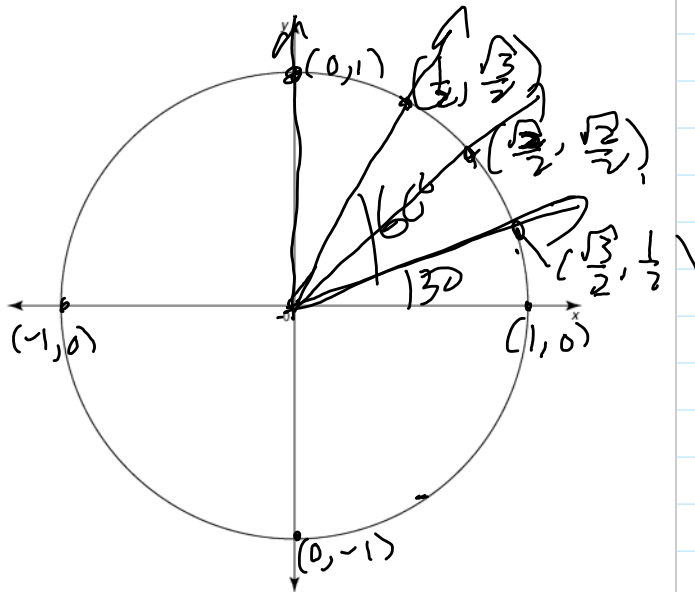Section 4.4: pages 211-213, Practise 1a), c), 2, 3a), c), 4a), c), 5a), c), e), 6a), c), e), 7 (all), 9, 13, 16.
Section 5.1: 1, 2, 3, 4a), d), 5b), d), 6, 7a), c), 8a), c), 9a), c), 10, 11a), c), 14, 18.

Hand-in Assignments: You should begin working on the Chapter 4 Hand-in Assignment. That assignment will possibly be due in on Tuesday, February 22 (maybe February 24).

This far

BLM 4-4

The Unit Circle

For the special angles:

- all the quadrantal angles
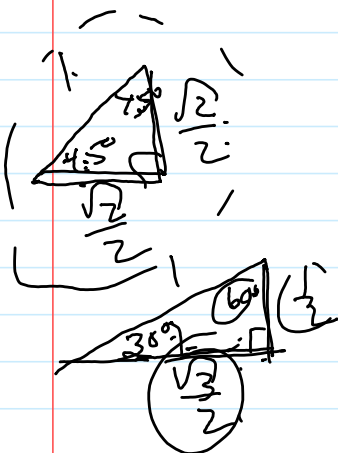- all angles having $30°, 45°, 60°$ as a reference angle.

You will need to be able to determine the exact values of the coordinates of the point where the terminal arm of the angle intersects the unit circle.

Rather than memorize all the coordinates of all the special angles, you can memorize the coordinates for the QI special angles $(30°, 45°, 60°)$

$$\frac{\pi}{6} \quad \frac{\pi}{4} \quad \frac{\pi}{3}$$
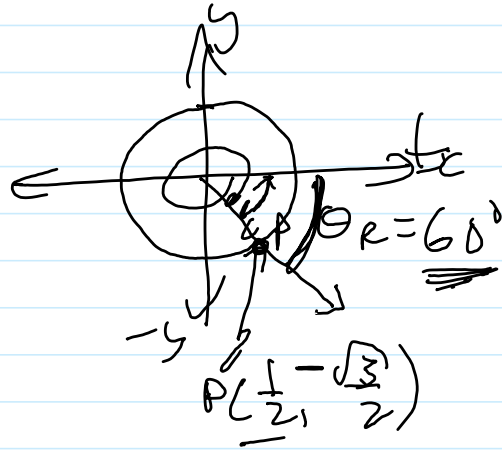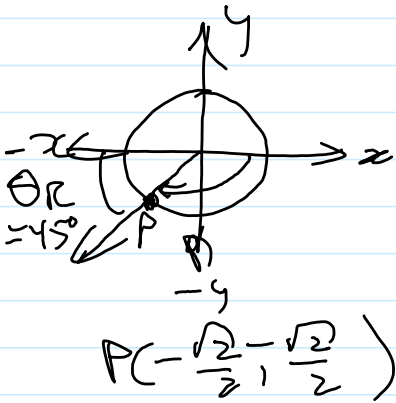
Then for any other (non-quadrantal angle):

1) sketch the angle in standard position

2) Determine the reference angle $(30° , 45° \text{ or } 60°)$

3) Change the sign(s) of the x & y coordinates as needed. This is determined by the quadrant that the terminal arm is in.

Determine the coordinates of the point P where the terminal arm of θ intersects the Unit Circle.

a) $\theta = -135°$ b) $\theta = -420°$

$P\left(-\dfrac{\sqrt{2}}{2}, -\dfrac{\sqrt{2}}{2}\right)$

$P\left(\dfrac{1}{2}, -\dfrac{\sqrt{3}}{2}\right)$

* If a question is in radians, your answer must be in radians for those questions where you need to solve for an angle.

— end of 4.2 —

Section 4.3: Trigonometric Ratios

In This section, you'll need to determine the exact value of the sine, cosine, tangent, secant, cosecant and/or

(y) (x)

cotangent of The special angles OR angles coterminal to the special angles Or angles having a special angle as the reference angle.

The point P where the terminal arm of an angle

intersects the unit circle has coordinates $P(\cos\theta, \sin\theta)$

The [CAST] rule

$\tan\theta < 0$
$\sin\theta > 0$
$\cos\theta < 0$
Sin (+)

I
$\tan\theta > 0$
$\sin\theta > 0$
$\cos\theta > 0$
All (+)

$P(\frac{x}{}, \frac{y}{})$
$P(\cos\theta, \sin\theta)$

$\cos\theta < 0$
$\sin\theta < 0$
$\tan\theta > 0$
Tan (+)

$\cos\theta > 0$
$\sin\theta < 0$
$\tan\theta < 0$
Cos (+)

$\cos\theta = x$
$\sin\theta = y$
$\tan\theta = \frac{y}{x}$

$\sec\theta = \frac{1}{x}$
$\csc\theta = \frac{1}{y}$
$\cot\theta = \frac{x}{y}$

S.
sin +

A
all +

T.
tan +

C. IV
cos is +

c)

All Students Take Calculus

Determining Inexact Values of Trig Ratios
with a calculator

- for most angles other than the special angles, exact
values of the sine, cosine, tangent, etc. ratios cannot
be easily determined.

- When asked for the "approximate value" of a
trig ratio, you may use your calculator to do so.

  - MAKE SURE THAT YOUR
    CALCULATOR IS IN THE
    CORRECT MODE.
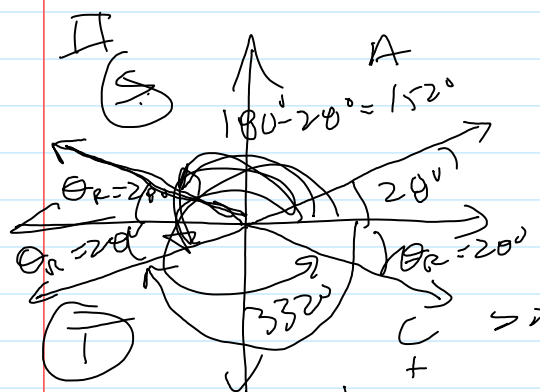
Determine: (round to 3 decimal places)

a) $\sin 58^\circ = 0.848$

b) $\tan\left(\dfrac{-5\pi}{2}\right) = 1.254$

c) $\sec(-165^\circ) = \dfrac{1}{\cos(-165^\circ)}$

$= -1.035$

d) $\csc 6.3 = \dfrac{1}{\sin 6.3} = 59.475$

For any angle in standard position, we can determine its sine, cosine, tangent, etc. using the same ratio for its reference angle and the CAST rule.

In QII, 152° has $\theta_R = 28^\circ$

$\therefore$ The sine, cosine, tangent, etc of 152° will be equal to the sine, cosine, tangent, etc of 28° but with a possible sign change

$\sin 152^\circ = + \sin 28^\circ$ $\cos 152^\circ = -\cos 28^\circ$
$\csc 152^\circ = \csc 28^\circ$ $\sec 152^\circ = -\sec 28^\circ$
$\tan 152^\circ = -\tan 28^\circ$
$\cot 152^\circ = -\cot 28^\circ$

In QIII, 208° has $\theta_R = 28^\circ$

$\sin 208^\circ = -\sin 28^\circ$ $\cos 208^\circ = -\cos 28^\circ$

$$\tan 200^\circ = + \tan 20^\circ$$