Date: NOV. 12 /19

Today's Learning Goal(s):

By the end of the class, I will be able to:

a) explain the relationship between the ratios of an angle in standard position, and the related acute angle (RAA).

b) determine the trig ratios of angles between 0^0 and 360^0.

Last day's work: p. 292 #1 – 4

pp. 299-300 #(1 – 5)ac

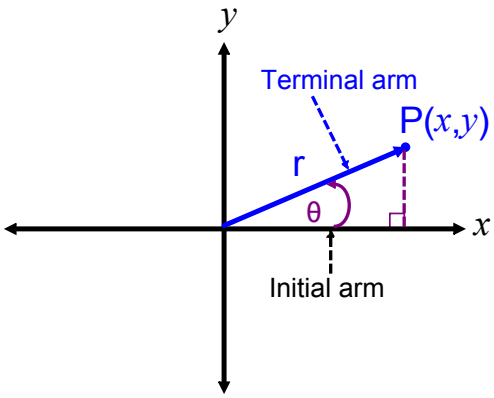
(3 screens away)

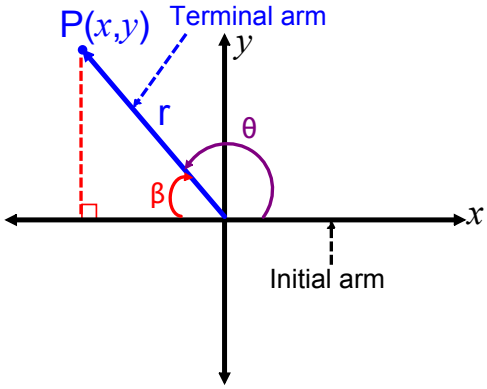
5ac
4
1b p292
3ac

Defining an angle in "standard position". **Explain: $0^o \leq \theta \leq 360^o$**

θ = Principal Angle

β = Related Acute Angle (RAA)





Note: In Quadrant I: θ = β

Complete/Memorize this Chart!

θ	30°	45°	60°
$\sin\theta$			
$\cos\theta$			
$\tan\theta$			

Memorize this Chart!

θ	30°	45°	60°
$\sin\theta$	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$ or $\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$
$\cos\theta$	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$ or $\frac{\sqrt{2}}{2}$	$\frac{1}{2}$
$\tan\theta$	$\frac{1}{\sqrt{3}}$ or $\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$

Are there any Homework Questions you would like to see on the board?

From Wednesday: pp. 286-287 # 1 – 9

Last day's work: p. 292 #1 – 4
pp. 299-300 #(1 – 5)ac

Today's Homework Practice includes:
pp. 299-300 #(1 – 5)bd
Standard Posion Wkst#8-3
1cd, 2bc, 6, 7a, 9

p. 292 **1.** State all the angles between $0°$ and $360°$ that make each equation true.

a) $\sin 45° = \sin$ [redacted]

b) $\cos$ [redacted] $= -\cos(-60°)$

c) $\tan 30° = \tan$ [redacted]

d) $\tan 135° = -\tan$ [redacted]

$LS = \cos\theta$

$\therefore \theta = 120°$

or

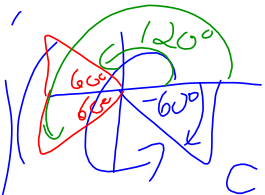
$\theta = 240°$

$RS = -\cos(-60°)$

$= -\cos(300°)$

$= -\left(\frac{1}{2}\right)$

$= -\frac{1}{2}$



$300°$

$\cos 300°$

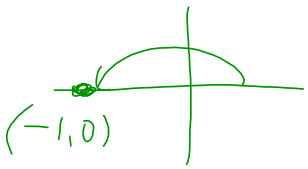
$= \pm \cos 60°$

$= \frac{1}{2}$

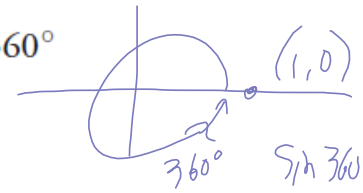
p. 299

3. Use the method in Example 3 to determine the primary trigonometric ratios for each given angle.

a) 180° b) 270° c) 360°



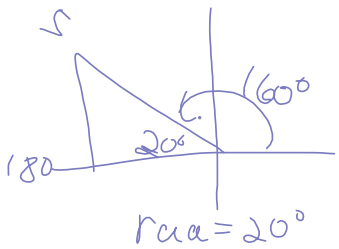
$\sin 180° = \frac{y}{r} = \frac{0}{1} = 0$ $\cos 180 = \frac{x}{r} = \frac{-1}{1} = -1$ $\tan 180° = \frac{y}{x} = \frac{0}{-1} = 0$



$\sin 360° = \frac{0}{1} = 0$ $\cos 360° = \frac{1}{1} = 1$ $\tan 360° = \frac{0}{1} = 0$

4. Use the related acute angle to state an equivalent expression.

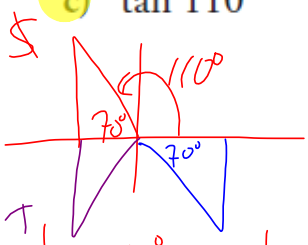
a) sin 160° b) cos 300° c) tan 110° d) sin 350°



$\sin 160° = +\sin 20°$

$= \sin 20°$

Also: $\sin(180° - 20°)$



$\tan 110° = -\tan 70°$

or $= -\tan(180° + 70°)$

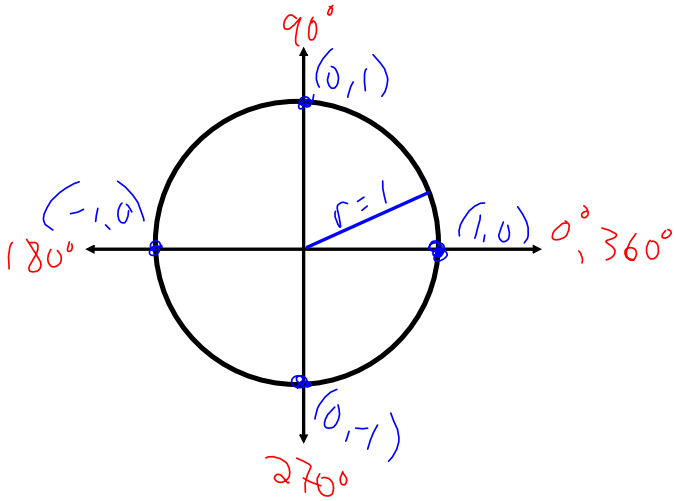
$= -\tan 250°$

$= -\tan(180° - 110°)$

or

$= +\tan(360 - 70°)$

$= +\tan 290°$

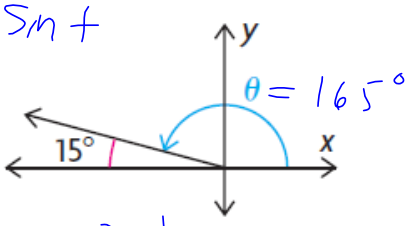


p. 300

5. i) For each angle θ, predict which primary trigonometric ratios are positive.
ii) Determine the primary trigonometric ratios to the nearest hundredth.

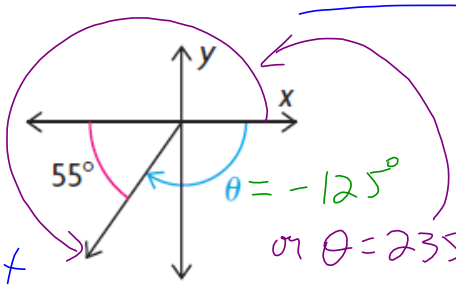
2 decimals

a) Sin +



$\sin 165^\circ$	$\cos 165^\circ$	$\tan 165^\circ$
$= +0.$	$= -0.$	$= -0.267$
$= 0.258$	$= -0.965$	$\doteq -0.27$
$\doteq 0.26$	$= -0.97$	

b)



or $\theta = 235^\circ$

tan +

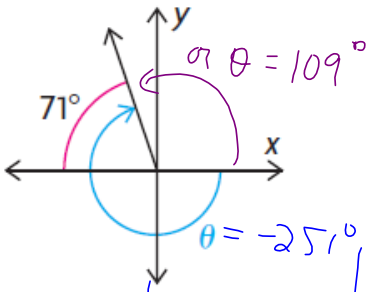
$\sin 235^\circ$	$\cos 235^\circ$	$\tan 235^\circ$
$\doteq -0.819$	$\doteq -0.573$	$\doteq 1.428$
$\doteq -0.82$	$= -0.57$	$\doteq 1.43$

Also $\sin(-125^\circ)$
$\doteq -0.82$

Sin +

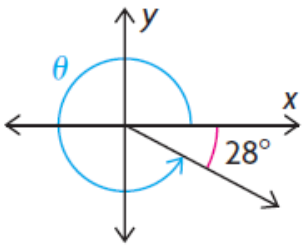
cos +ve

c)



$\sin(-251^\circ)$	$\cos(-251^\circ)$	$\tan(-251^\circ)$
$\doteq 0.945$	$\doteq -0.325$	$\doteq -2.904$
$\doteq 0.95$	$\doteq -0.33$	$\doteq -2.90$
$\doteq \sin(109^\circ)$		$\doteq$

d)



$\theta = 332^\circ$

$\sin 332^\circ$	$\cos 332^\circ$	$\tan 332^\circ$
$\doteq -0.469$	$\doteq 0.882$	$\doteq -0.531$
$\doteq -0.47$	$\doteq 0.88$	$\doteq -0.53$

(From Lesson 5.1; 3 lessons ago)

p. 282

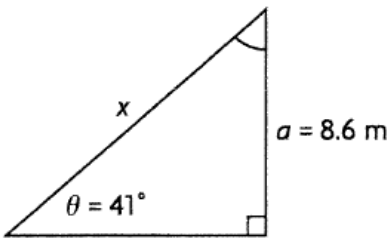
11. A kite is flying 8.6 m above the ground at an angle of elevation of 41°.

A Calculate the length of string, to the nearest tenth of a metre, needed to fly the kite using

a) a primary trigonometric ratio

b) a reciprocal trigonometric ratio

11.



The kite, string, and ground form a right triangle. The length of the string is the hypotenuse of the right triangle and the height above ground the opposite side of the triangle, therefore:

a) $\sin\theta = \dfrac{\text{opposite}}{\text{hypotenuse}}$

$\sin 41° = \dfrac{8.6}{x}$

$x = \dfrac{8.6}{\sin 41°}$

$= \dfrac{8.6}{0.65}$

$= 13.1 \text{ m}$

b) $\csc\theta = \dfrac{1}{\sin\theta}$

$\csc\theta = \dfrac{x}{8.6}$

$\csc 41° = \dfrac{1}{\sin 41°}$

$\dfrac{1}{\sin 41°} = \dfrac{x}{8.6}$

$\dfrac{1}{0.66} = \dfrac{x}{8.6}$

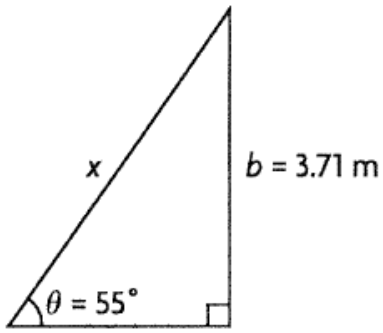
$x = \dfrac{8.6}{0.66}$

$= 13.1 \text{ m}$

p. 282 (From Lesson 5.1; 3 lessons ago)

14. The two guy wires supporting an 8.5 m TV antenna each form an angle of 55° with the ground. The wires are attached to the antenna 3.71 m above ground. Using a reciprocal trigonometric ratio, calculate the length of each wire to the nearest tenth of a metre. What assumption did you make?

14.



The TV antenna, guy wire, and ground form a right triangle. The length of the guy wire is the hypotenuse of the right triangle and the height that the guy wire is attached is the opposite side of the triangle, therefore:

$$\csc\theta = \frac{\text{hypotenuse}}{\text{opposite}}$$

$$\csc\theta = \frac{x}{3.71}$$

$$\csc 55° = \frac{1}{\sin 55°}$$

$$\frac{1}{\sin 55°} = \frac{x}{3.71}$$

$$\frac{1}{0.82} = \frac{x}{3.71}$$

$$x = \frac{3.71}{0.82}$$

$$= 4.5 \text{ m}$$