Date: _____

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

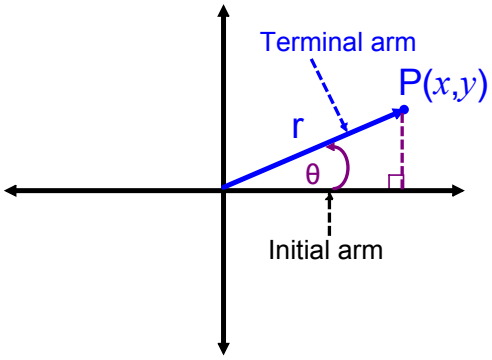
pp. 299-300 #(1 – 5)ac

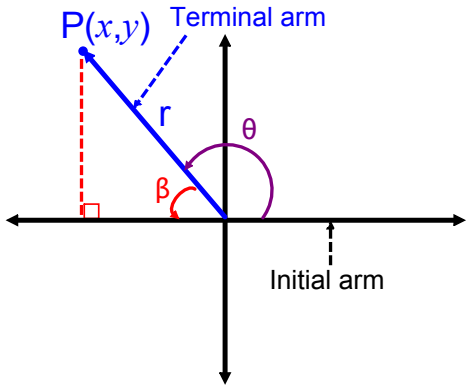
(3 screens away)

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

θ = Principal Angle

β = Related Acute Angle (RAA)





Note: In Quadrant I: θ = β

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?

Asked for on Monday: pp. 280-282

5(iv), 9, 10, 11, 14

(A few screens later)

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#1

8-3 1cd, 2bc, 6, 7a, 9

Extra STUFF on website!

p.292 16) $\cos\_\_\_\_ = -\cos(-60°)$

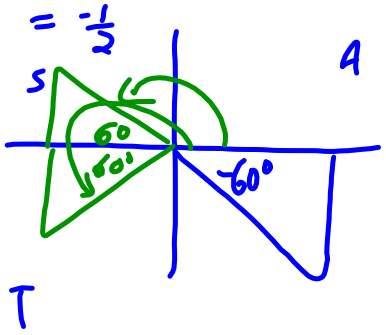
$= -\left(\frac{1}{2}\right)$

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

$\theta = 120°$

or

$\theta = 240°$



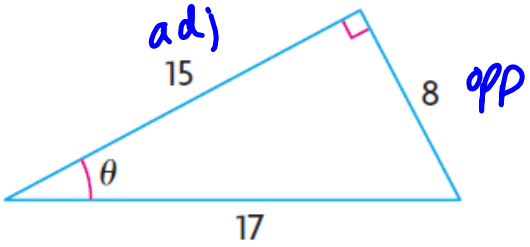
$\cos 60° = \frac{1}{2}$

p. 281 # 5(iv)

5. a) For each triangle, ~~calculate~~ determine csc θ, sec θ, and cot θ.

K **b)** For each triangle, use one of the reciprocal ratios from part (a) to determine θ to the nearest degree.

iv)



a) hyp

$\csc\theta = \frac{\text{hyp}}{\text{opp}} = \frac{17}{8}$

$\sec\theta = \frac{\text{hyp}}{\text{adj}} = \frac{17}{15}$

$\cot\theta = \frac{\text{adj}}{\text{opp}} = \frac{15}{8}$

b) $\csc\theta = \frac{17}{8}$

$\theta = \csc^{-1}\left(\frac{17}{8}\right)$

$= \sin^{-1}\left(\frac{8}{17}\right)$

$\doteq 28.07$

$\doteq 28^\circ$

if $\cot\theta = \frac{15}{8}$

$\theta = \cot^{-1}\left(\frac{15}{8}\right)$

$= \tan^{-1}\left(\frac{8}{15}\right)$

$\doteq 28.07$

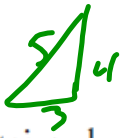
$\doteq 28^\circ$

p. 281 **9.** Given any right triangle with an acute angle θ,

a) explain why csc θ is always greater than or equal to 1

b) explain why cos θ is always less than or equal to 1

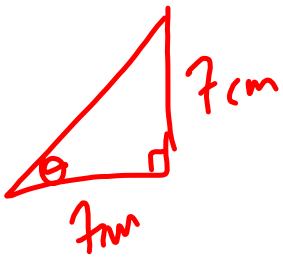
$\sin\theta = \frac{opp}{hyp}$ $\csc\theta = \frac{hyp}{opp}$

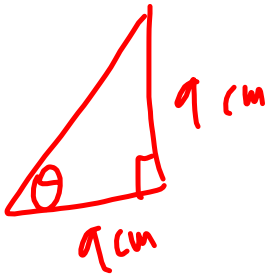


p. 282

10. Given a right triangle with an acute angle θ, if tan θ = cot θ, describe what this triangle would look like.

$\tan\theta = \frac{opp}{adj}$ $\cot\theta = \frac{adj}{opp}$





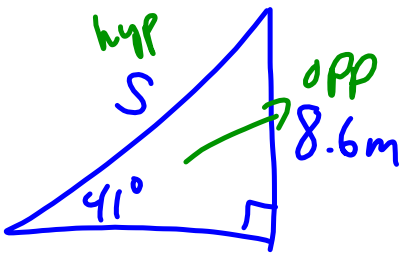
p. 282

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



a) SOH

$\sin 41° = \frac{8.6}{S}$

$S = \frac{8.6}{\sin 41°}$

$\doteq 13.10$

$\doteq 13.1 \text{ m}$

b) $\csc\theta = \frac{\text{hyp}}{\text{opp}}$

$\csc 41° = \frac{S}{8.6}$

$8.6 \csc 41° = S$

$8.6\left(\frac{1}{\sin 41°}\right) = S$

$13.10 \doteq S$

$13.1 \doteq S$

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

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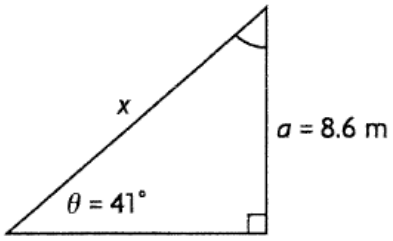
b) a reciprocal trigonometric ratio

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

$$\sin 41° = \frac{8.6}{x}$$

$$x = \frac{8.6}{\sin 41°}$$

$$= \frac{8.6}{0.65}$$

$$= 13.1 \text{ m}$$

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

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

$$\csc 41° = \frac{1}{\sin 41°}$$

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

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

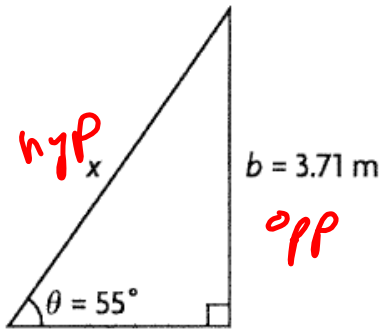
$$x = \frac{8.6}{0.66}$$

$$= 13.1 \text{ m}$$

p. 282

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:

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

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

$$\csc 55° = \frac{1}{\sin 55°}$$

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

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

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

$$= 4.5 \text{ m}$$

$\csc 55° = \frac{x}{3.71}$

$x = 3.71 \csc 55°$

$= 3.71\left(\frac{1}{\sin 55°}\right)$

$\doteq 4.52$

$\doteq 4.5$ m