# Today's Learning Goal(s):

Date: _Nov. 17/15_

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 $360^0$.
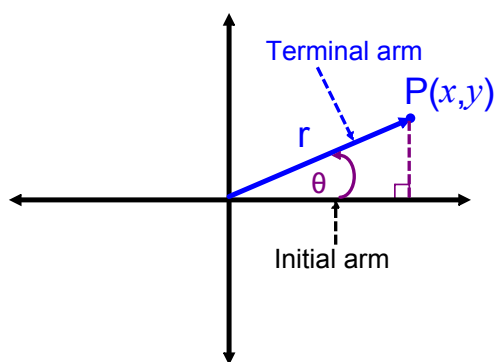
Last day's work: p. 292 #1 – 4
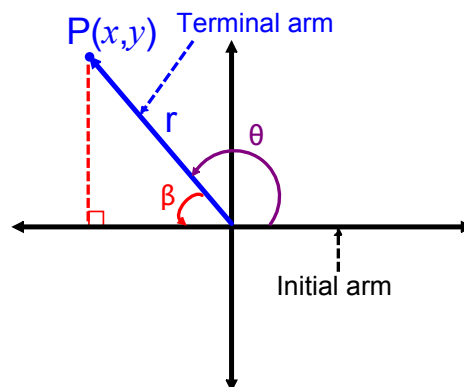
pp. 299-300 #(1 – 5)ac

(3 screens away)

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

θ = Principal Angle

β = Related Acute Angle (RAA)



**Note:  In Quadrant I:  θ = β**

## Complete/Memorize this Chart!

| $\theta$ | 30° | 45° | 60° |
|---|---|---|---|
| $\sin\theta$ | | | |
| $\cos\theta$ | | | |
| $\tan\theta$ | | | |

## Memorize this Chart!

| $\theta$ | 30° | 45° | 60° |
|---|---|---|---|
| $\sin\theta$ | $\dfrac{1}{2}$ | $\dfrac{1}{\sqrt{2}}$ **or** $\dfrac{\sqrt{2}}{2}$ | $\dfrac{\sqrt{3}}{2}$ |
| $\cos\theta$ | $\dfrac{\sqrt{3}}{2}$ | $\dfrac{1}{\sqrt{2}}$ **or** $\dfrac{\sqrt{2}}{2}$ | $\dfrac{1}{2}$ |
| $\tan\theta$ | $\dfrac{1}{\sqrt{3}}$ **or** $\dfrac{\sqrt{3}}{3}$ | 1 | $\sqrt{3}$ |

**3**

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

Friday's work:     pp. 286-287 # 1 – 9 [13 – 15]

Asked for yesterday:     p. 287 # 8, 9

Last day's work: p. 292 #1 – 4     3a, 2, 1b

pp. 299-300 #(1 – 5)ac     4ac

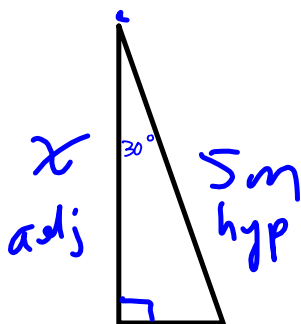*Extra STUFF on website!*

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

p.287

8. A 5 m stepladder propped against a classroom wall forms an angle of 30°
A with the wall. Exactly how far is the top of the ladder from the floor? Express
your answer in radical form. What assumption did you make?

$$CAH$$

$x$ adj $\quad$ 30° $\quad$ 5m hyp

$$\cos 30° = \frac{x}{5}$$

$$\frac{\sqrt{3}}{2} = \frac{x}{5}$$

$$\frac{5\sqrt{3}}{2}m = x$$

p.287

**9.** Show that $\tan 30° + \dfrac{1}{\tan 30°} = \dfrac{1}{\sin 30° \cos 30°}$.

$LS = \tan 30° + \dfrac{1}{\tan 30°}$

$= \dfrac{1}{\sqrt{3}} + \dfrac{1}{\frac{1}{\sqrt{3}}}$

$= \dfrac{1}{\sqrt{3}} + \dfrac{\sqrt{3} \times \sqrt{3}}{1 \times \sqrt{3}}$

$= \dfrac{1}{\sqrt{3}} + \dfrac{3}{\sqrt{3}}$

$= \dfrac{4}{\sqrt{3}}$

$RS = \dfrac{1}{\sin 30° \cos 30°}$

$= \dfrac{1}{\left(\frac{1}{2}\right)\left(\frac{\sqrt{3}}{2}\right)}$

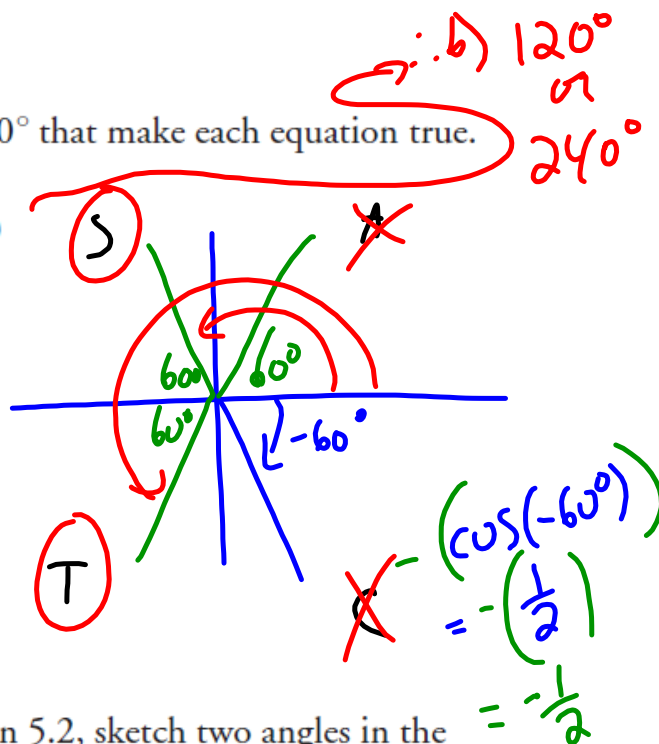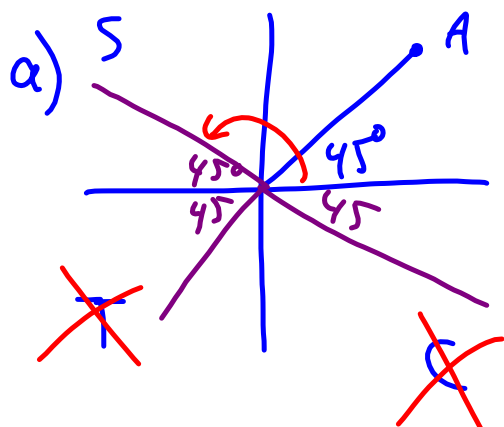$= \dfrac{1}{\frac{\sqrt{3}}{4}}$

$= \dfrac{4}{\sqrt{3}}$

$\therefore LS = RS$

$\therefore Q.E.D.$

6

p.292

1. State all the angles between $0°$ and $360°$ that make each equation true.
   a) $\sin 45° = \sin$ $\boxed{135°}$
   b) $\cos$ $\boxed{\phantom{xxx}}$ $= -\cos(-60°)$

∴ b) $120°$ or $240°$

a)

S    A

$45°$
$45°$   $45°$
$45°$

S

T

$60°$   $60°$
$60°$   $-60°$

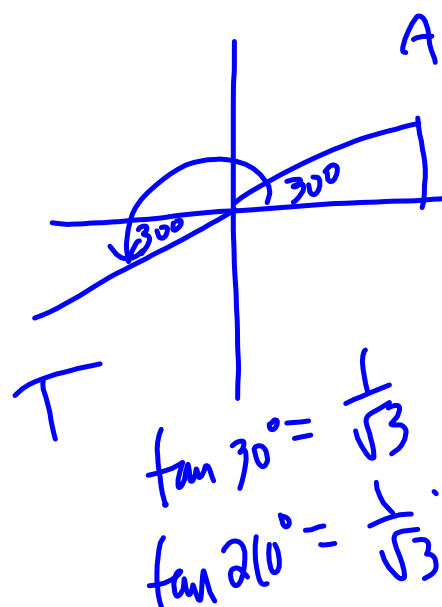$-(\cos(-60°))$
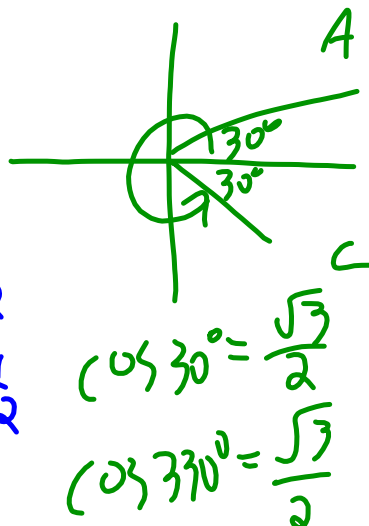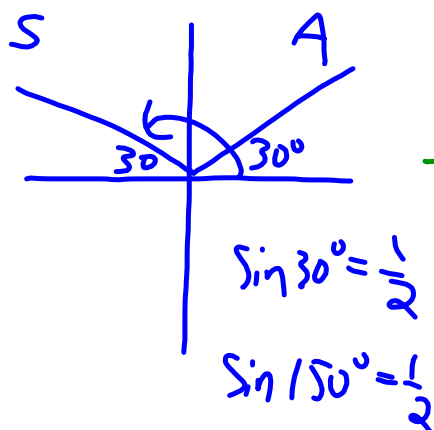$= -\left(\frac{1}{2}\right)$
$= -\frac{1}{2}$

2. Using the special triangles from Lesson 5.2, sketch two angles in the Cartesian plane that have the same value for each given trigonometric ratio.
   a) sine          b) cosine          c) tangent

S          A

$30$   $30°$

$\sin 30° = \frac{1}{2}$

$\sin 150° = \frac{1}{2}$

A

$30°$
$30°$

C

$\cos 30° = \frac{\sqrt{3}}{2}$

$\cos 330° = \frac{\sqrt{3}}{2}$

A

$30°$

$30°$

T

$\tan 30° = \frac{1}{\sqrt{3}}$

$\tan 210° = \frac{1}{\sqrt{3}}$

p.292

**3.** Sylvie drew a special triangle in quadrant 3 and determined that
tan $(180° + \theta) = 1$.

a) What is the value of angle $\theta$?
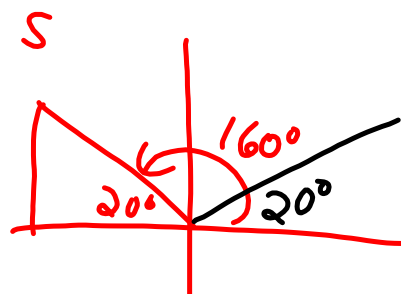
$\tan \beta = 1$

$\therefore \beta = 45°$

$225°$

$45°$

$\theta$

$\therefore \theta = 225°$

T
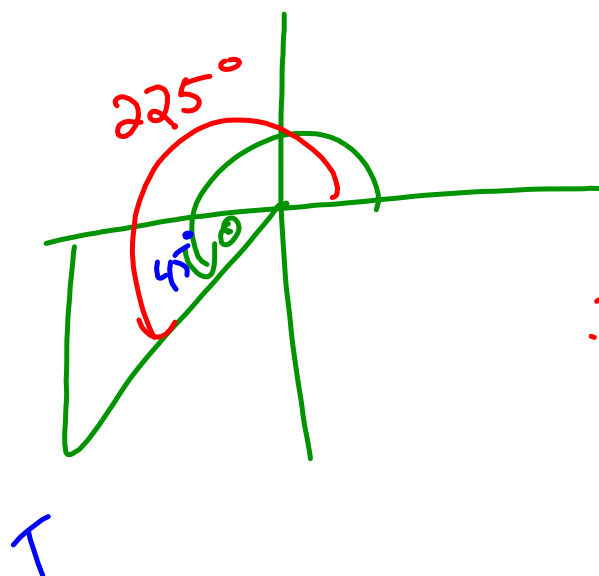
p.299

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

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

S

160°

20°

20°

$\sin 160°$

$= \sin 20°$

110°

70°

70°

$\therefore \tan 110°$

$= \tan 290°$

$$P(3,7)$$

$$\sin\theta = \frac{y}{r}$$

$$\sin\theta = \frac{7}{\sqrt{58}} \Bigg\} \frac{7}{7.61}$$

$$\doteq 0.919$$

$$\doteq 0.92$$

$$r^2 = x^2 + y^2$$
$$= (3)^2 + (7)^2$$
$$= 9 + 49$$
$$= 58$$
$$r = \sqrt{58}$$