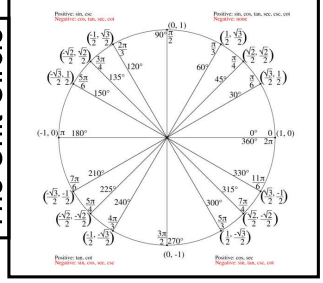
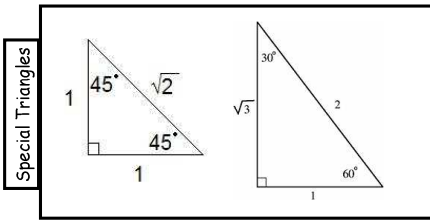
4.4 NOT so "Special" Angles

Recall those special angles..... 0°,30°, 45°,60°, etc

The Unit Circle



Special Triangles



$$\csc\theta = \frac{1}{\sin\theta} = \frac{r}{y}$$
$$\sec\theta = \frac{1}{\cos\theta} = \frac{r}{x}$$
$$\cot\theta = \frac{1}{\tan\theta} = \frac{x}{y}$$

Ex.1 Find the exact values of the following

a) sin 300°

$= -\frac{\sqrt{3}}{2}$

b) cot 135°

$\cot 135° = \frac{1}{\tan 135°}$

$= -1$

$\tan 135° = -1$

c) cos 270°

$= 0$

d) tan 90°

= undefined

e) cos 180°

$= -1$

f) cot 315°

$= \frac{1}{\tan 315°}$

$= -1$

g) sin (-240°)

RAA = 60°

$\sin(-240°) = \frac{\sqrt{3}}{2}$

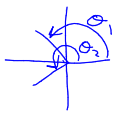
h) cos 1050°

RAA = 30°

$\cos 1050° = \frac{\sqrt{3}}{2}$

Ex.2 Find the value of θ for $0° \le \theta \le 360°$.

a) $\cos\theta = \frac{-\sqrt{3}}{2}$



RAA = 30°

$\theta_1 = 180° - 30°$

$= 150°$

$\theta_2 = 180° + 30°$

$= 210°$

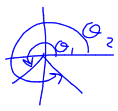
$A = 150°, 210°$

b) csc θ= $-\sqrt{2}$

$\csc\theta = \frac{1}{\sin\theta}$

$\sin\theta = \frac{1}{-\sqrt{2}}$

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



RAA = 45°

$\theta_1 = 180° + 45°$

$= 225°$

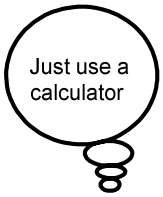
$\theta_2 = 360° - 45°$

$= 315°$

$A = 225°, 315°$

Nov 8-3:31 PM

What happens when the angles are NOT so special???



Ex.2 Evaluate

a) $\sin 93^0$ $\doteq 0.9986$

b) $\tan 342^\circ$ $\doteq -0.3249$

c) $\cos 212^0$ $= -0.8480$

x^{-1} $\frac{1}{x}$

d) $\csc 143^0$

$= \frac{1}{\sin 143^\circ}$

$= (\sin 143^\circ)^{-1}$

$\doteq 1.6616$

e) $\sec(-104^0)$

$= \frac{1}{\cos(-104^\circ)}$

$\doteq -4.1336$

f) $\cot 315^0$

$= [\tan 315^\circ]^{-1}$

$= -1$

Ex. 4 Determine the value of θ for $0^\circ \le \theta \le 360^\circ$.

a) $\sin\theta = 0.7314$

① RAA $= \sin^{-1}(0.7314)$

$\doteq 47^\circ$

② S | A / T | C

③ $\theta = 47^\circ, 133^\circ$

b) $\cos\theta = -0.906$

① RAA $= 25^\circ$

② S | A / T | C

③ $\theta = 155^\circ, 205^\circ$

c) $\csc\theta = -3.8637$

$\sin\theta = \frac{1}{-3.8637}$

① RAA $= \sin^{-1}\left(\frac{1}{-3.8637}\right)$

$\doteq 15^\circ$

② S | A / T | C

③ $\theta = 195^\circ, 345^\circ$

d) $\cot\theta = -0.4663$

① RAA $= \tan^{-1}([0.4663]^{-1})$

$= 65^\circ$

② 

③ $\theta = 115^\circ, 295^\circ$

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Let me at it!!!
Hand-out 4.4
Careful #3,4,12 only gives one answer.
ASSUME 0^{o} to 360^{o}

Nov 8-4:09 PM