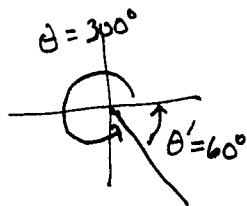warm-up examples

① [famous angle → value of trig function]

Find $\sin 300°$, $\cos 300°$ and $\tan 300°$.

That   is $\sin\theta$, $\cos\theta$, $\tan\theta$ for $\theta = 300°$.

$\theta = 300°$

$\theta' = 60°$

Q1 : what quadrant is θ is?   Quadrant IV

Q2 : what is $\theta' =$ reference angle? $\theta' = 360° - 300°$

$$= 60°$$

what are these?
$$\begin{cases} \sin\theta' = \sin 60° = \sqrt{3}/2 \\ \cos\theta' = \cos 60° = 1/2 \\ \tan\theta' = \tan 60° = \sqrt{3} \end{cases}$$

what are these?
$$\begin{cases} \sin\theta = -\sqrt{3}/2 \\ \cos\theta = 1/2 \\ \tan\theta = -\sqrt{3} \end{cases}$$

Recall :

	sin	cos	tan
$0°$	$\frac{\sqrt{0}}{2} = 0$	1	0
$30°$	$\frac{\sqrt{1}}{2} = \frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$
$45°$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	1
$60°$	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$
$90°$	$\frac{\sqrt{4}}{2} = 1$	0	undef.

② [value of a trig function → all possible famous angles]

Find all values of θ such that $\cos\theta = -\frac{1}{2}$ and

θ is in $[0°, 360°)$.

Q1 : Cosine is negative in which quadrants? II or III.

Q2 : For what acute angle θ' is $\cos\theta' = \frac{1}{2}$? $\theta' = 60°$.
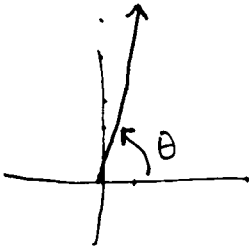
$\theta' = 60°$ θ_1

$\theta' = 60°$ θ_2
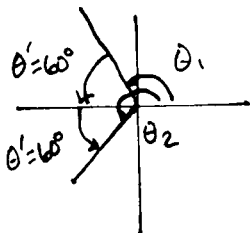
so $\theta_1 = 180° - 60° = 120°$

and $\theta_2 = 180° + 60° = 240°$ are the two angles we're looking for.

2.3   Find a value of θ in $[0°, 90°)$ such that

30) $\tan \theta = 6.435\ 884\ 1$

Answer: $\theta = \tan^{-1} 6.435\ 884\ 1 = \arctan 6.435\ 884_1$

$= 81.168°$

36) $\sec \theta = 1.160\ 624\ 9$ so

$\cos \theta = \dfrac{1}{\sec \theta} = \dfrac{1}{1.160\ 624\ 9}$ so, in turn

$\theta = \cos^{-1} \left(\dfrac{1}{1.160\ 624\ 9} \right)$

$= \cos^{-1} 0.861\ 604\ 8131$

$= 30.5°$

TRY
THIS   38) $\cos \theta = 0.855\ 364\ 28$ Find θ in $[0°, 90°)$
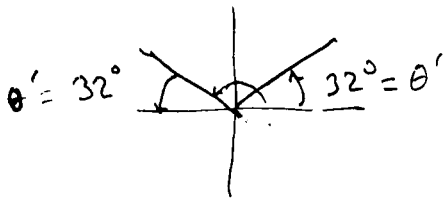
$\theta = \cos^{-1} 0.855\ 364\ 28$

$= 31.2°$

64)   Find <u>two</u> angles in $[0°, 360°)$

Such that $\sin \theta = 0.529\ 919\ 26$.

Q1: where is sine positive?   I and II.

Q2: What is θ'?

$$\theta' = \sin^{-1} 0.529\ 919\ 26$$
$$= 32°$$

$\theta' = 32°$ $32° = \theta'$

So $\theta = 32°$

<u>OR</u> $\theta = 180° - 32 = 148°$