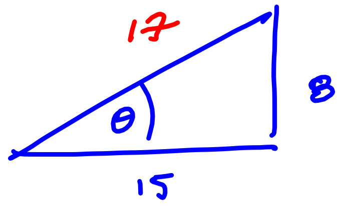
§1.3

⋮

#s 9-12 find the 6 trigs from the given info.

(9)



$$\sqrt{8^2+15^2} = \sqrt{64+225} = \sqrt{289} = 17$$

$$\boxed{\begin{array}{ll} \sin\theta = \frac{8}{17} & \csc\theta = \frac{17}{8} \\ \cos\theta = \frac{15}{17} & \sec\theta = \frac{17}{15} \\ \tan\theta = \frac{8}{15} & \cancel{\tan}\ \cot\theta = \frac{15}{8} \end{array}}$$

(56) $\dfrac{\tan\beta+\cot\beta}{\tan\beta} \overset{?}{=} \csc^2\beta$

$$\frac{\tan\beta+\cot\beta}{\tan\beta} = \frac{\tan\beta}{\tan\beta} + \frac{\cot\beta}{\tan\beta}$$

$\to \cot\beta\cot\beta$

most don't memorize

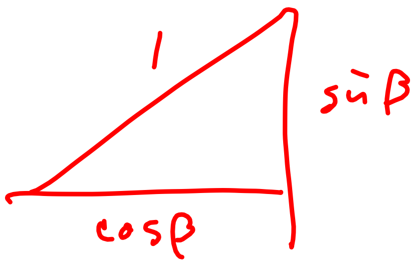
$$= \boxed{1+\cot^2\beta = \csc^2\beta}$$

by Pythagorean Identities

$$1+\left(\frac{\cos\beta}{\sin\beta}\right)^2 = 1+\frac{\cos^2\beta}{\sin^2\beta} = \frac{\sin^2\beta+\cos^2\beta}{\sin^2\beta} = \frac{1}{\sin^2\beta}$$

$$= \left(\frac{1}{\sin\beta}\right)^2 = (\csc\beta)^2$$

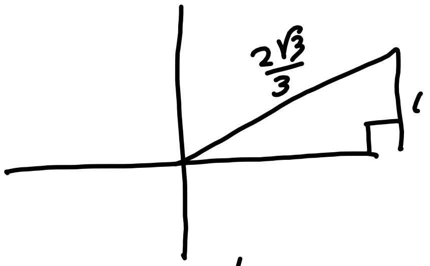
$$= \csc^2\beta$$



§1.4 #93

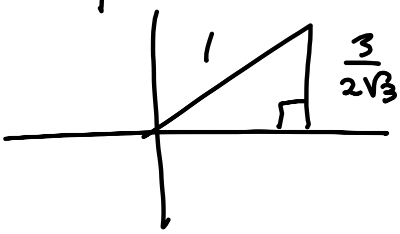
(a) $\csc\theta = \frac{2\sqrt{3}}{3}$

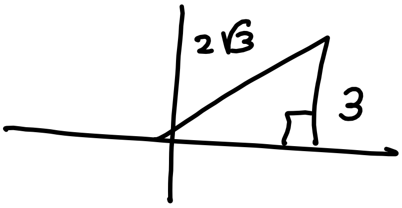
(b) $\cot\theta = -1$



or $\sin\theta = \frac{1}{\frac{2\sqrt{3}}{3}}$

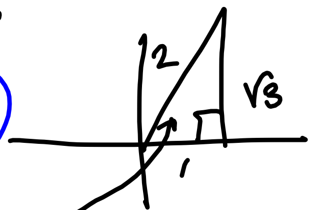
$\boxed{\sin\theta = \frac{3}{2\sqrt{3}}}$



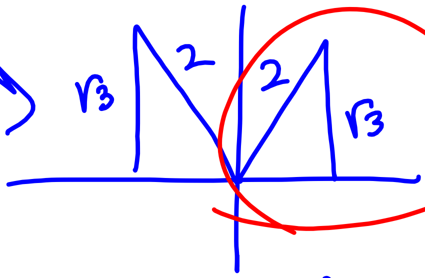


$$\frac{2\sqrt{3}}{3}\cdot\frac{\sqrt{3}}{\sqrt{3}} = \frac{2\cdot 3}{3\cdot\sqrt{3}} = \frac{2}{\sqrt{3}} = \csc\theta$$

$\sin\theta = \frac{\sqrt{3}}{2}$



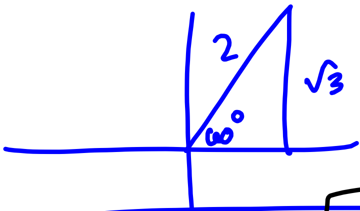
60°



calculator's SIN^{-1} only sees this one.

But ∃ 2.

Calc. gives 60°



so

$\theta = 60°, 120°$, $420°, 480°$ Not asked.

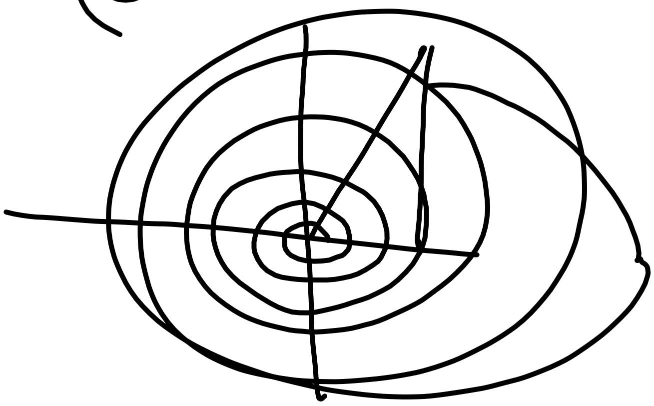
$= \frac{\pi}{3}, \frac{2\pi}{3}$, $\frac{7\pi}{3}, -\frac{5\pi}{3}$

How do you handle $\frac{37\pi}{3}$

$$= \frac{36\pi}{3} + \frac{\pi}{3}$$

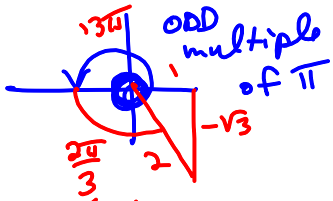
$$= 12\pi + \frac{\pi}{3}$$

The ref. angle.

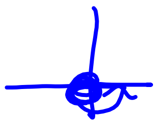


$$\frac{41\pi}{3} = \frac{39\pi}{3} + \frac{2\pi}{3}$$

$$= \underline{13\pi} + \frac{2\pi}{3}$$



Even multiple of π

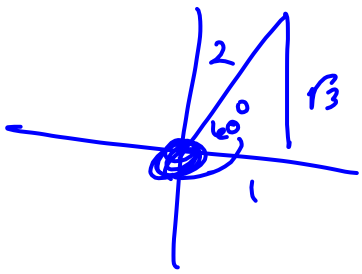


$$\frac{37\pi}{\cancel{3}} \cdot \frac{\cancel{180}^{60}}{\cancel{\pi}} = 37 \cdot 60^\circ = 2220^\circ$$

$$\frac{2220^\circ}{360^\circ} = 6.1\overline{6}$$

$$6 \times 360 = 2160$$

$$\begin{array}{r} 2220 \\ -\,2160 \\ \hline 60^\circ \end{array} \qquad 2220 = 2160 + 60$$

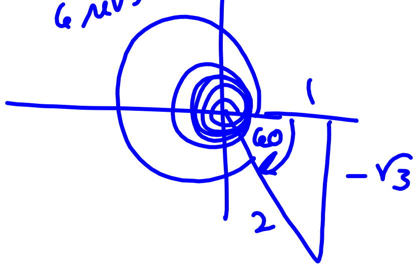


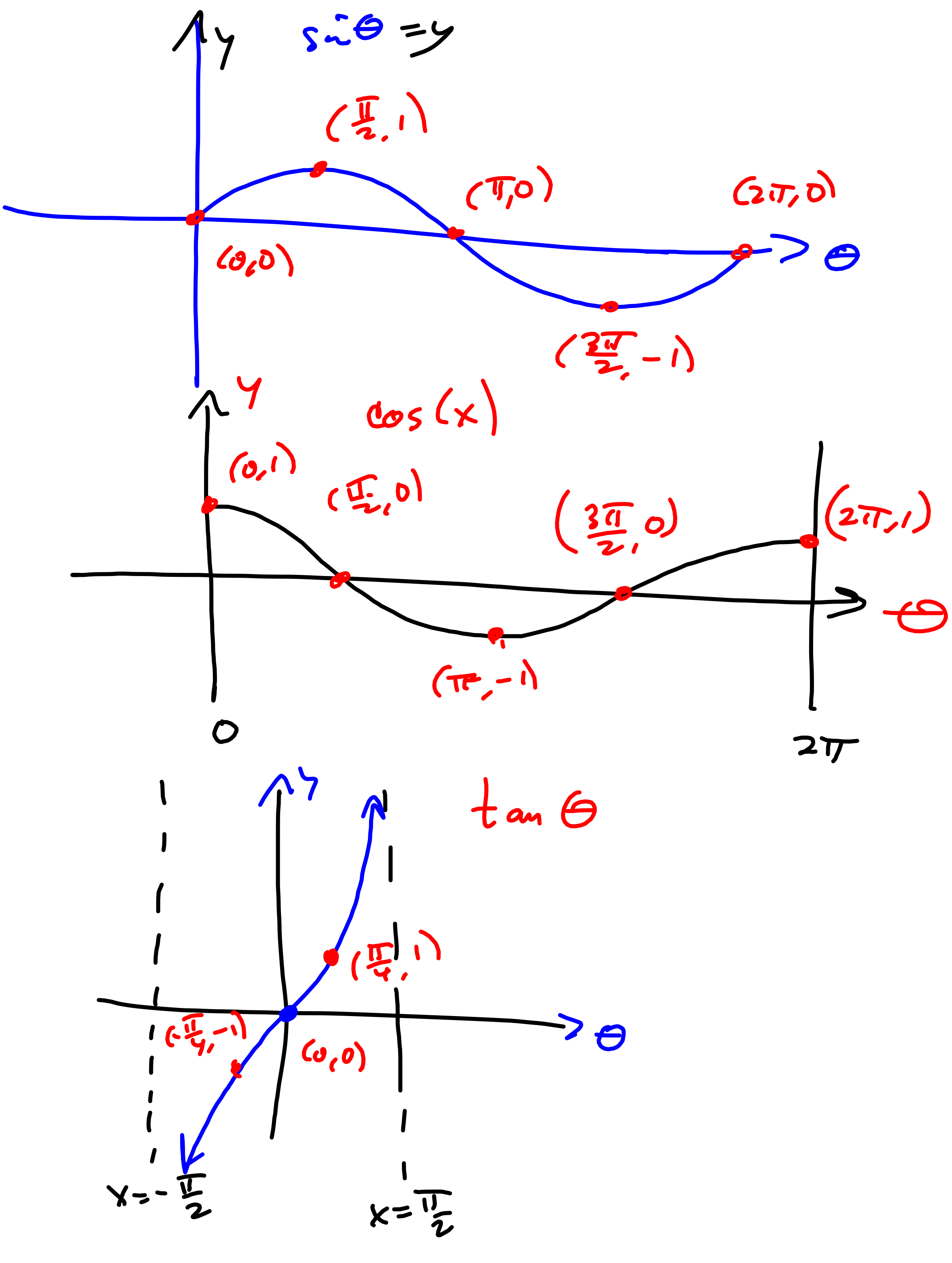
$$\frac{41\pi}{3} \cdot \frac{180}{\pi} = 41 \cdot 60 = 2460$$

$$\frac{2460^\circ}{\frac{360^\circ}{1\text{ rev}}} = 6.8\overline{3} \text{ revolutions}$$

$$\left(.8\overline{3} \text{ revs}\right)\left(\frac{360^\circ}{1 \text{ rev}}\right) \approx$$

6 revs + 300°




y
sin θ = y
(π/2, 1)
(π, 0)
(2π, 0)
(0, 0)
(3π/2, -1)
θ
y
cos (x)
(0, 1)
(π/2, 0)
(3π/2, 0)
(2π, 1)
(π, -1)
θ
0
2π
y
tan θ
(π/4, 1)
(-π/4, -1)
(0, 0)
θ
x = -π/2
x = π/2