

MTH30

Homework

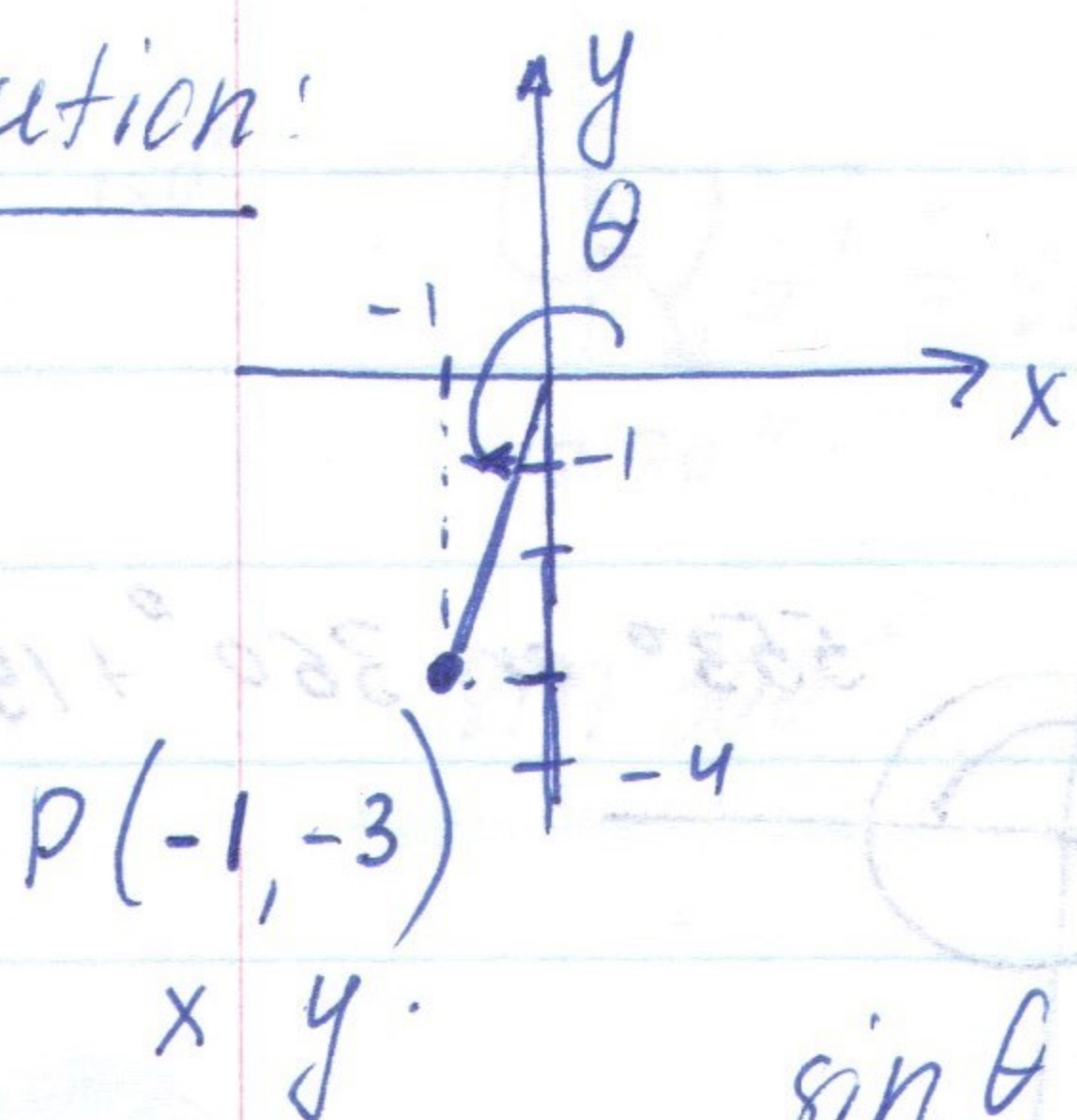
Section 4.4/ 8, 26, 62, 80, 18, 30, 36, 52, 58, 78

#8

$(-1, -3)$ - a point on the terminal side of angle θ .

Find the exact value of six trig. f. at θ .

Solution:



let's find radius of the circle:

$$r = \sqrt{(-1)^2 + (-3)^2} = \sqrt{1+9} = \sqrt{10}$$

$$\sin \theta = \frac{y}{r} = \frac{-3}{\sqrt{10}} = \boxed{-\frac{3\sqrt{10}}{10}}$$

$$\cos \theta = \frac{x}{r} = -\frac{1}{\sqrt{10}} = \boxed{-\frac{\sqrt{10}}{10}}$$

$$\tan \theta = \frac{y}{x} = \frac{-3}{-1} = \boxed{+3}, \quad \cot \theta = \frac{x}{y} = \boxed{\frac{1}{3}}$$

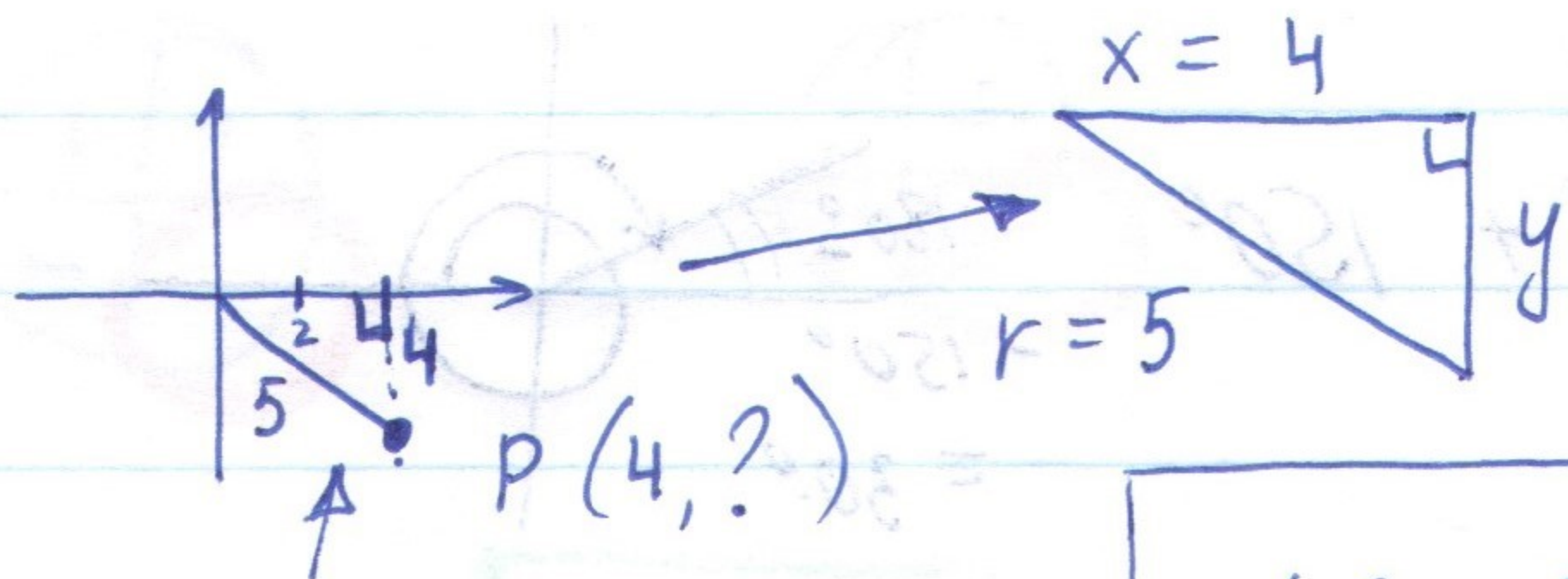
$$\csc \theta = \frac{r}{y} = \boxed{\frac{\sqrt{10}}{-3}}, \quad \sec \theta = \frac{r}{x} = \left\{ \frac{\sqrt{10}}{-1} \right\} = \boxed{-\sqrt{10}}$$

#26

$\cos \theta = \frac{4}{5}$, θ in quadrant IV.

find exact value of each of the remaining functions.

Solution:



$$\sin \theta = \frac{y}{r} = \boxed{\frac{-3}{5}}$$

$$\tan \theta = \frac{y}{x} = \boxed{\frac{-3}{4}}$$

$$\cot \theta = \frac{x}{y} = \boxed{\frac{4}{-3}}$$

$$\csc \theta = \frac{r}{y} = \boxed{\frac{5}{-3}}, \quad \sec \theta = \frac{r}{x} = \boxed{\frac{5}{4}}$$

$$\cos \theta = \frac{x}{r}$$

right triangle ± 3
 $4^2 + y^2 = 5^2$
solve for y ... $y = -3$

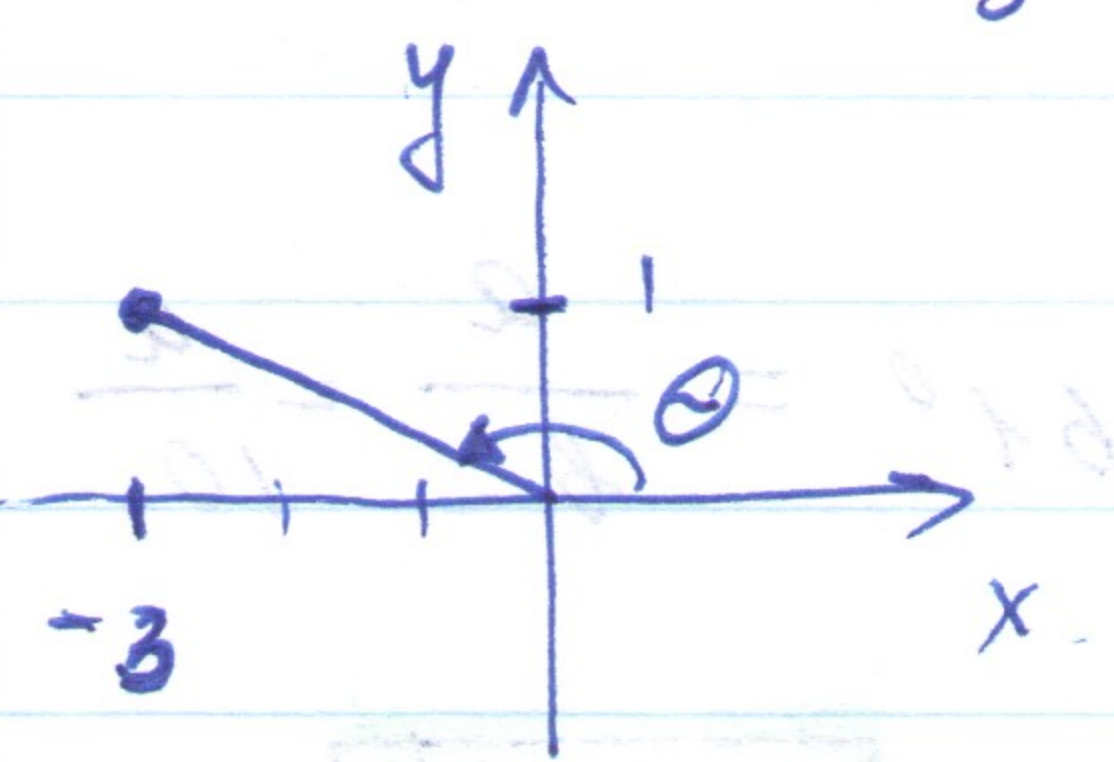
#30

$\tan \theta = -\frac{1}{3}, \quad \sin \theta > 0$

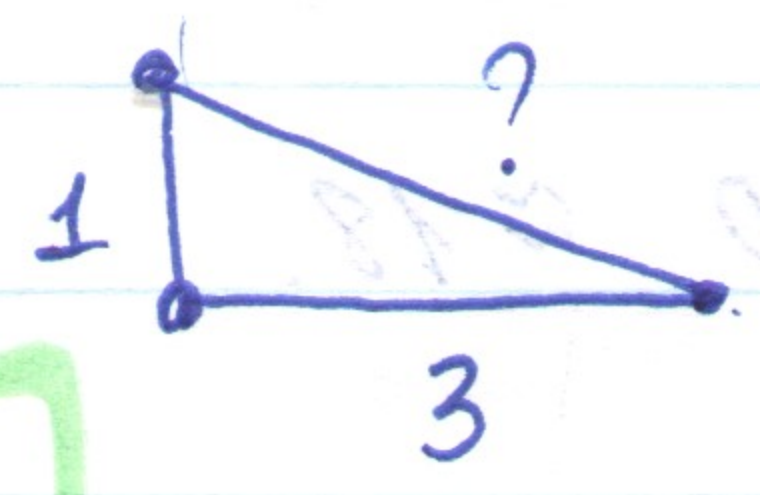


therefore θ is in quadrant II

$\cot \theta = \frac{1}{-\frac{1}{3}} = -3$



$\tan \theta = \frac{y}{x} = -\frac{1}{3} = \frac{1}{-3}$



$c^2 = 1^2 + 3^2$
 $c^2 = 1 + 9 = 10$
 $c = \sqrt{10}$

$\sin \theta = \frac{1}{\sqrt{10}} = \frac{\sqrt{10}}{10}$

$\cos \theta = \frac{-3}{\sqrt{10}} = \frac{-3\sqrt{10}}{10}$

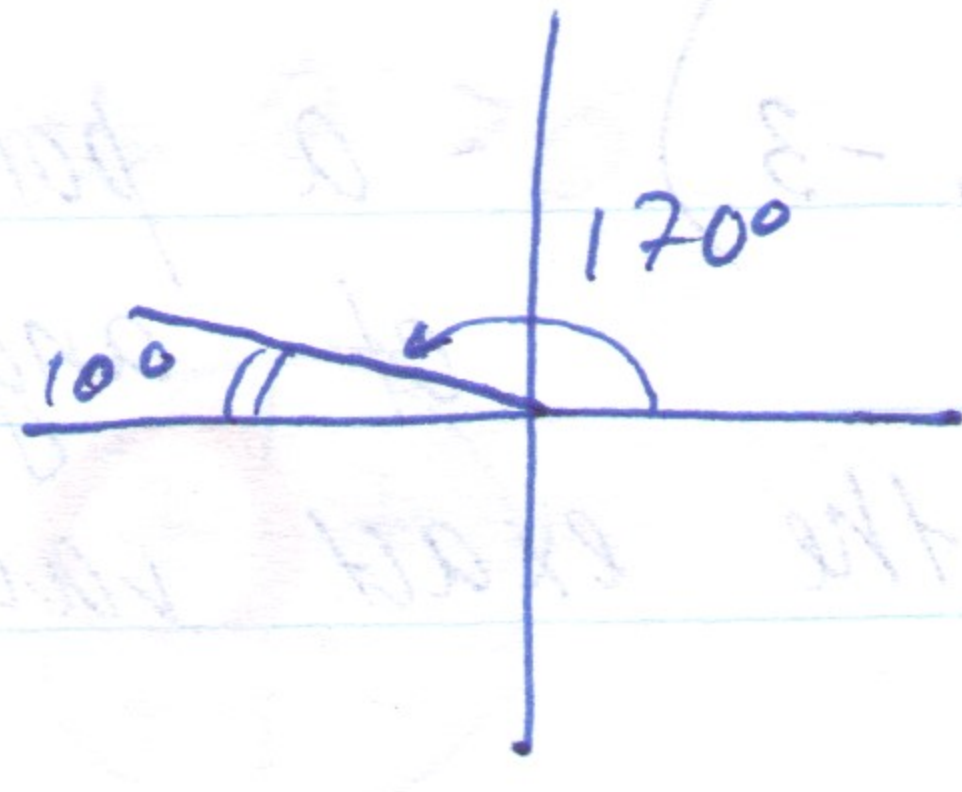
$\csc \theta = \frac{r}{y} = \frac{\sqrt{10}}{1} = \sqrt{10}$

$\sec \theta = \frac{r}{x} = \frac{\sqrt{10}}{-3} = -\frac{\sqrt{10}}{3}$

#360

170°
reference angle:

10°

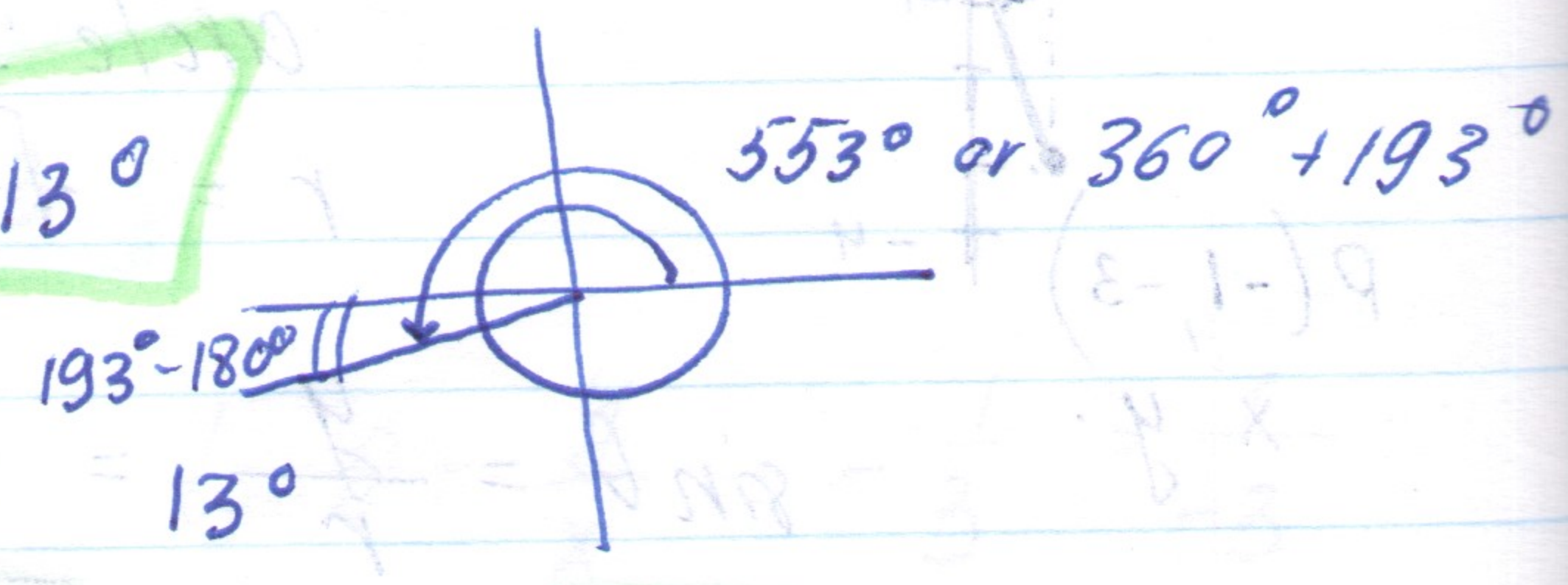


#52

553°
reference angle:

13°

553° - 360° = 193°

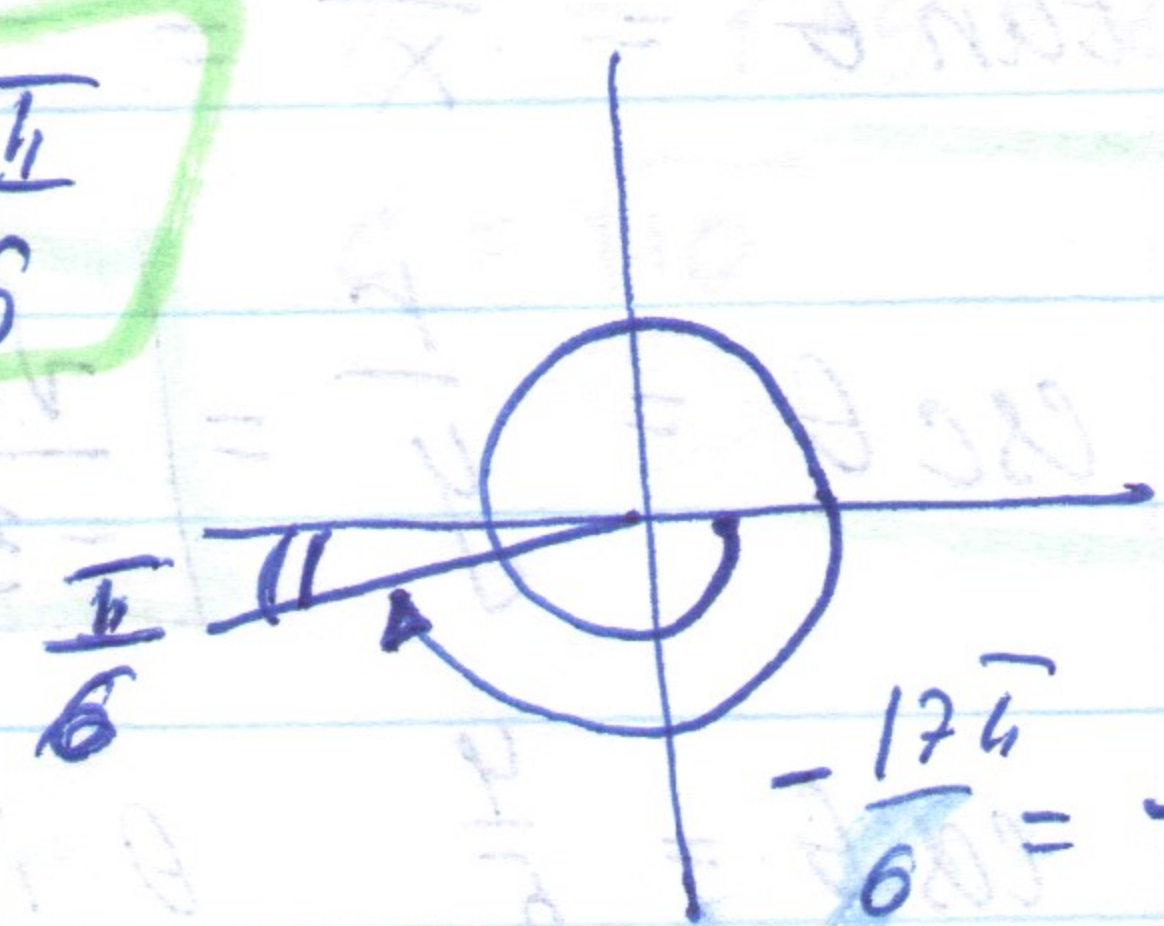


#58

$-\frac{17\pi}{6} = -\left(\frac{12\pi}{6} + \frac{5\pi}{6}\right) = -2\pi - \frac{5\pi}{6}$

reference angle:

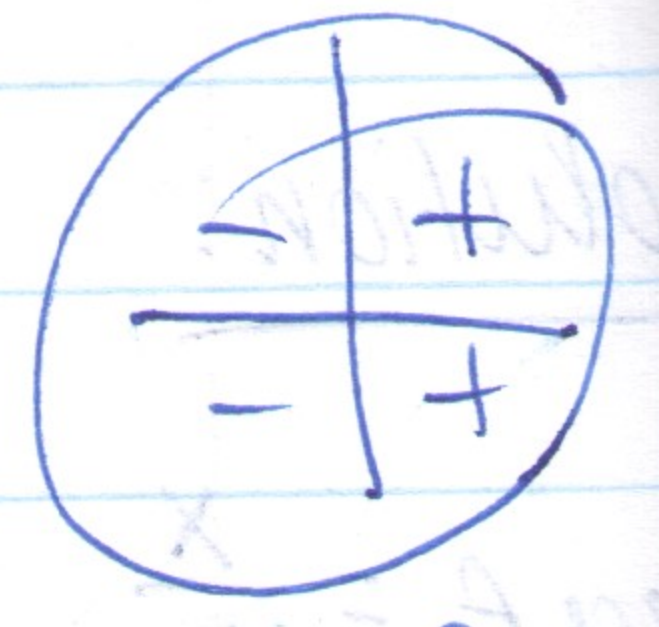
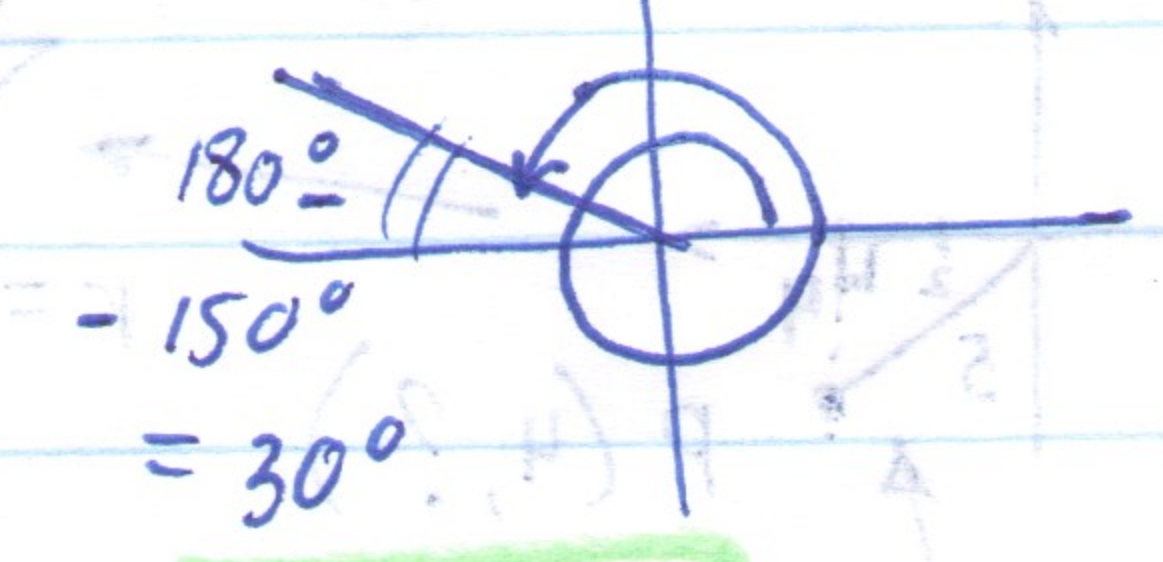
$\frac{5\pi}{6}$



$-\frac{17\pi}{6} = -2\pi - \frac{5\pi}{6}$

#78

sec 510°
510° = 360° + 150°

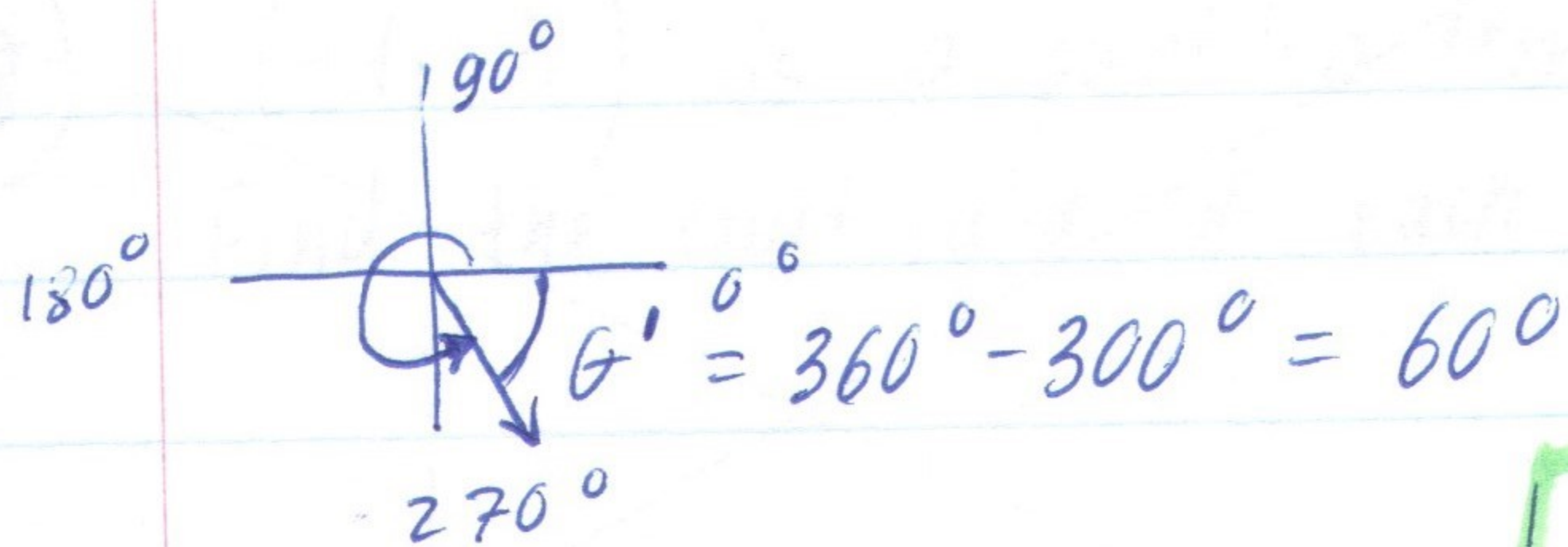


sec θ

sec 510° = -sec(30°) = $-\frac{2\sqrt{3}}{3}$

#62

find $\sin 300^\circ$ using reference angle without calculator.



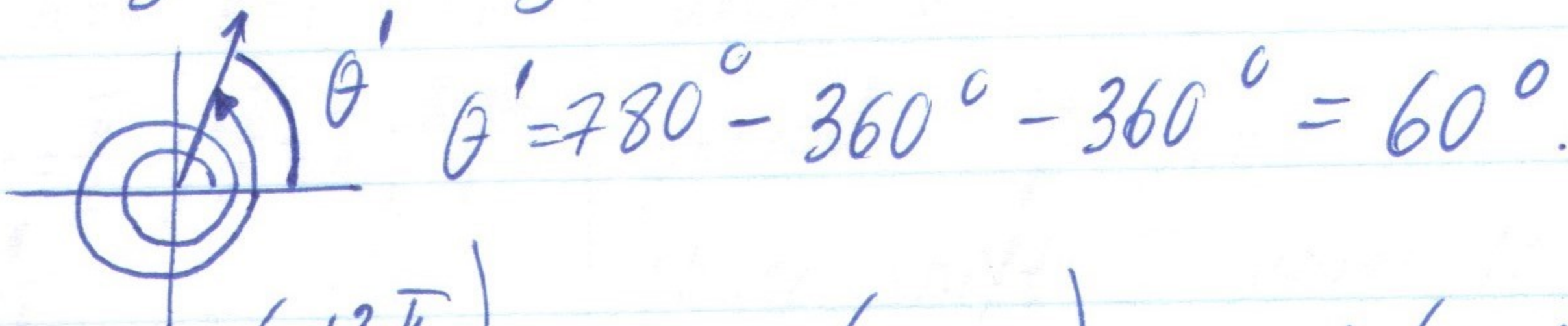
$$\sin 300^\circ = \sin 60^\circ = \frac{\sqrt{3}}{2}$$

using table + sin is negative in quadrant IV.

#80

find $\cot \frac{13\pi}{3}$ using reference angle, without calculator.

$$\frac{13\pi}{3} = \frac{13 \cdot 180^\circ}{3} = 13 \cdot 60^\circ = 780^\circ$$

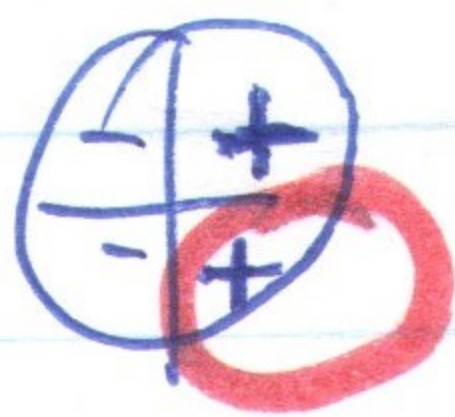
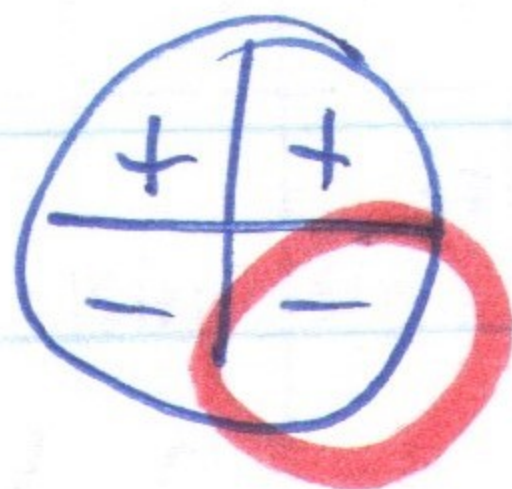


$$\cot \left(\frac{13\pi}{3} \right) = \cot (780^\circ) = \cot (60^\circ) = \frac{\sqrt{3}}{3}$$

using table + cot is positive in quadrant I.

#18

$$\sin \theta < 0, \cos \theta > 0$$



quadrant IV