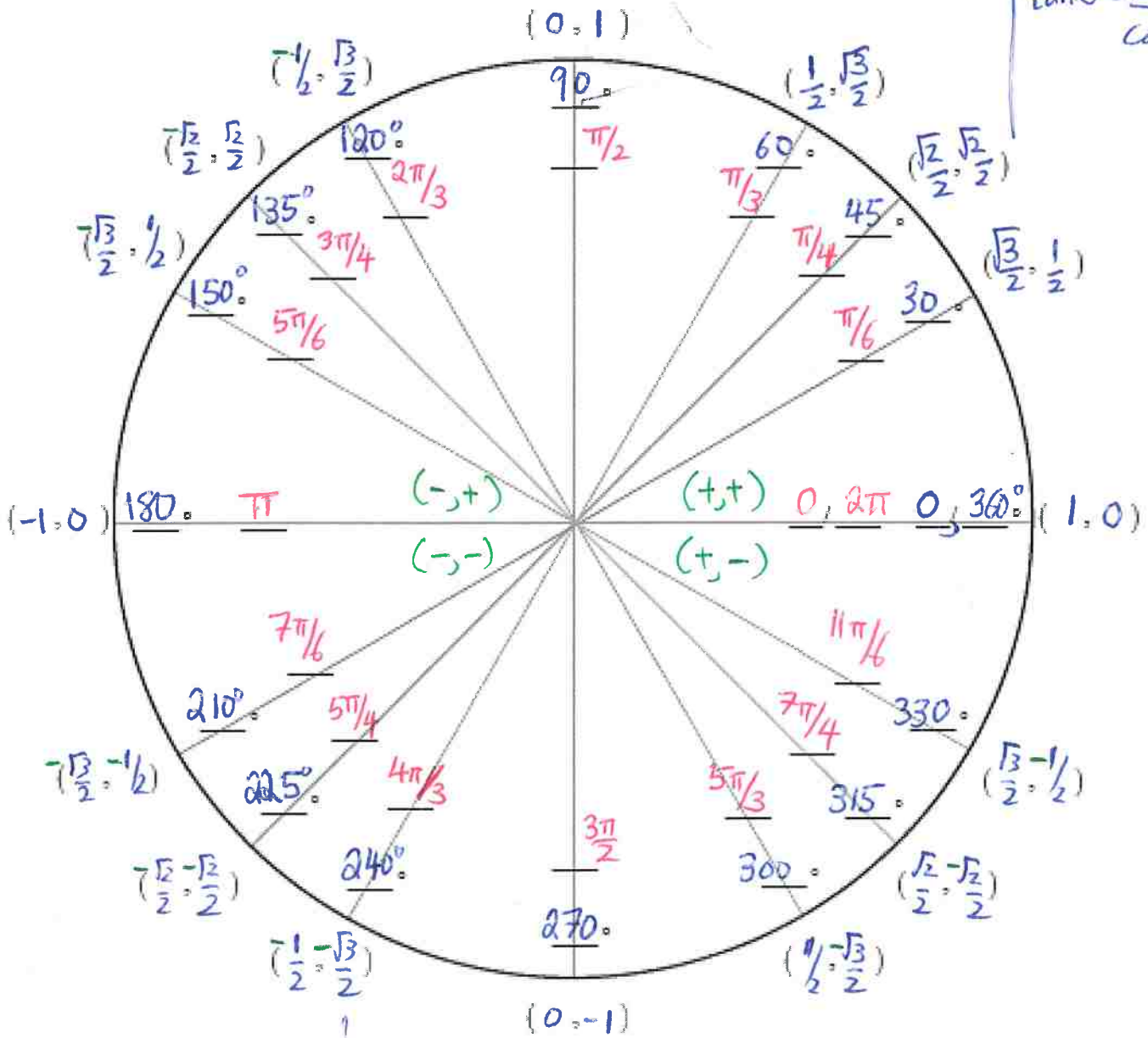


1.12 HW: Try filling out the unit circle

(Radius = 1)

$(\overset{x}{\cos \theta}, \overset{y}{\sin \theta})$

$$\tan \theta = \frac{\sin \theta}{\cos \theta}$$



$$\cos \theta = x$$

$$\sec \theta = \frac{1}{x} \rightarrow \frac{1}{\cos \theta}$$

$$\sin \theta = y$$

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

$$\tan \theta = \frac{y}{x} \rightarrow \frac{\sin \theta}{\cos \theta}$$

$$\cot \theta = \frac{x}{y} \rightarrow \frac{\cos \theta}{\sin \theta}$$

The Unit Circle Table of Values

| | | | x | y | y/x | flip cos | flip sin | flip tan |
|--------|-----------|--|-----------------------|-----------------------|-----------------------|------------------------|------------------------|-----------------------|
| Degree | Radian | Coordinates | cos θ | sin θ | tan θ | sec θ | csc θ | cot θ |
| 0° | 0 | (1,0) | 1 | 0 | 0 | 1 | und | und |
| 30° | $\pi/6$ | $(\frac{\sqrt{3}}{2}, \frac{1}{2})$ | $\frac{\sqrt{3}}{2}$ | $\frac{1}{2}$ | $\frac{\sqrt{3}}{3}$ | $\frac{2\sqrt{3}}{3}$ | 2 | $\sqrt{3}$ |
| 45° | $\pi/4$ | $(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2})$ | $\frac{\sqrt{2}}{2}$ | $\frac{\sqrt{2}}{2}$ | 1 | $\sqrt{2}$ | $\sqrt{2}$ | 1 |
| 60° | $\pi/3$ | $(\frac{1}{2}, \frac{\sqrt{3}}{2})$ | $\frac{1}{2}$ | $\frac{\sqrt{3}}{2}$ | $\sqrt{3}$ | 2 | $\frac{2\sqrt{3}}{3}$ | $\frac{\sqrt{3}}{3}$ |
| 90° | $\pi/2$ | (0,1) | 0 | 1 | und | und | 1 | 0 |
| 120° | $2\pi/3$ | $(-\frac{1}{2}, \frac{\sqrt{3}}{2})$ | $-\frac{1}{2}$ | $\frac{\sqrt{3}}{2}$ | $-\sqrt{3}$ | -2 | $\frac{2\sqrt{3}}{3}$ | $-\frac{\sqrt{3}}{3}$ |
| 135° | $3\pi/4$ | $(-\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2})$ | $-\frac{\sqrt{2}}{2}$ | $\frac{\sqrt{2}}{2}$ | -1 | $-\sqrt{2}$ | $\sqrt{2}$ | -1 |
| 150° | $5\pi/6$ | $(-\frac{\sqrt{3}}{2}, \frac{1}{2})$ | $-\frac{\sqrt{3}}{2}$ | $\frac{1}{2}$ | $-\frac{\sqrt{3}}{3}$ | $-\frac{2\sqrt{3}}{3}$ | 2 | $-\sqrt{3}$ |
| 180° | π | (-1,0) | -1 | 0 | 0 | -1 | und | und |
| 210° | $7\pi/6$ | $(-\frac{\sqrt{3}}{2}, -\frac{1}{2})$ | $-\frac{\sqrt{3}}{2}$ | $-\frac{1}{2}$ | $\frac{\sqrt{3}}{3}$ | $-\frac{2\sqrt{3}}{3}$ | -2 | $\sqrt{3}$ |
| 225° | $5\pi/4$ | $(-\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2})$ | $-\frac{\sqrt{2}}{2}$ | $-\frac{\sqrt{2}}{2}$ | 1 | $-\sqrt{2}$ | $-\sqrt{2}$ | 1 |
| 240° | $4\pi/3$ | $(-\frac{1}{2}, -\frac{\sqrt{3}}{2})$ | $-\frac{1}{2}$ | $-\frac{\sqrt{3}}{2}$ | $\sqrt{3}$ | -2 | $-\frac{2\sqrt{3}}{3}$ | $\frac{\sqrt{3}}{3}$ |
| 270° | $3\pi/2$ | (0,-1) | 0 | -1 | und | und | 1 | 0 |
| 300° | $5\pi/3$ | $(\frac{1}{2}, -\frac{\sqrt{3}}{2})$ | $\frac{1}{2}$ | $-\frac{\sqrt{3}}{2}$ | $-\sqrt{3}$ | 2 | $-\frac{2\sqrt{3}}{3}$ | $-\frac{\sqrt{3}}{3}$ |
| 315° | $7\pi/4$ | $(\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2})$ | $\frac{\sqrt{2}}{2}$ | $-\frac{\sqrt{2}}{2}$ | -1 | $\sqrt{2}$ | $-\sqrt{2}$ | -1 |
| 330° | $11\pi/6$ | $(\frac{\sqrt{3}}{2}, -\frac{1}{2})$ | $\frac{\sqrt{3}}{2}$ | $-\frac{1}{2}$ | $-\frac{\sqrt{3}}{3}$ | $\frac{2\sqrt{3}}{3}$ | -2 | $-\sqrt{3}$ |
| 360° | 2π | (1,0) | 1 | 0 | 0 | 1 | und | und |