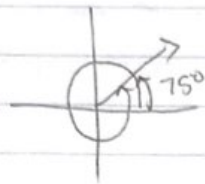


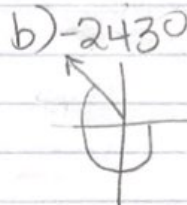
# Handout 4.3B.

1. a)  $75^\circ$



$$\theta_1 = 360 + 75^\circ = 435^\circ$$

$$\theta_2 = -(360 - 75) = -285^\circ$$



$$\theta_r = -243 + 360 = 117^\circ$$

$$\theta_1 = 180 - 63 = 117^\circ$$

c)  $405^\circ$

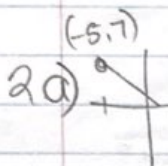


$$\theta_r = 405 - 360 = 45^\circ$$

$$\theta_1 = 45^\circ$$

$$\theta_2 = -(360 - 45) = -315^\circ$$

$$\theta_2 = 360 + 117 = 477^\circ$$



$$r^2 = (-5)^2 + (7)^2 = 25 + 49$$

$$r = \sqrt{74}$$

$$\sin \theta = \frac{7}{\sqrt{74}} = \frac{7\sqrt{74}}{74}$$

$$\cos \theta = \frac{-5}{\sqrt{74}} = \frac{-5\sqrt{74}}{74}$$

$$\tan \theta = \frac{-7}{5}$$

$$\cot \theta = \frac{-5}{7}$$

$$\csc \theta = \frac{\sqrt{74}}{7}$$

$$\sec \theta = \frac{-\sqrt{74}}{5}$$

b)  $P(-6, 5)$

$$r^2 = (-6)^2 + (5)^2 = 36 + 25$$

$$r = \sqrt{61}$$

$$\sin \theta = \frac{5\sqrt{61}}{61}$$

$$\cos \theta = \frac{-6\sqrt{61}}{61}$$

$$\tan \theta = \frac{-5}{6}$$

$$\csc \theta = \frac{61}{5}$$

$$\sec \theta = \frac{-61}{6}$$

$$\cot \theta = \frac{-6}{5}$$

c)  $P(-2, -3)$

$$r^2 = (-2)^2 + (-3)^2 = 4 + 9$$

$$r = \sqrt{13}$$

$$\sin \theta = \frac{-3\sqrt{13}}{13}$$

$$\cos \theta = \frac{-2\sqrt{13}}{13}$$

$$\tan \theta = \frac{3}{2}$$

$$\csc \theta = \frac{-\sqrt{13}}{3}$$

$$\sec \theta = \frac{-\sqrt{13}}{2}$$

$$\cot \theta = \frac{2}{3}$$

3.  $330^\circ$

$$\theta_r = 30^\circ$$

$$\sin 330 = -\frac{1}{2}$$

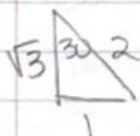
$$\cos 330 = \frac{\sqrt{3}}{2}$$

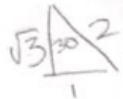
$$\tan 330 = \frac{-\sqrt{3}}{3}$$

$$\csc 330 = -2$$

$$\sec 330 = \frac{2\sqrt{3}}{2}$$

$$\cot 330 = -\sqrt{3}$$

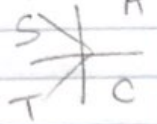




4, A

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

$$\theta_r = 30^\circ$$



Q II

$$\tan \theta = -\frac{1}{\sqrt{3}} = -\frac{\sqrt{3}}{3} \quad \text{Q III} \quad \tan \theta = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$$

$$\csc \theta = 2$$

$$\theta = 180 - 30$$

$$= 150^\circ$$

$$\csc \theta = -2$$

$$\theta = 180 + 30$$

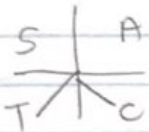
$$= 210^\circ$$

5.  $\sin \theta = -\frac{1}{2}$

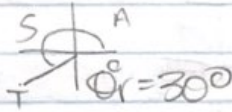
$$\theta = 330^\circ$$

$$\text{Q}_3; \theta = 210^\circ$$

$$\theta_r = 30^\circ$$



6.  $\cos 210$   
 $= -\cos 30$   
 $= -\frac{\sqrt{3}}{2}$

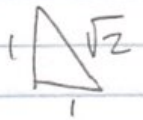
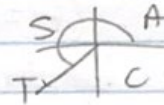


$$\sec 225^\circ$$

$$= -\sec 45^\circ$$

$$= -\sqrt{2}$$

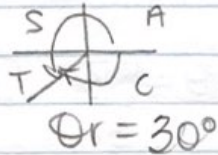
$$\theta_r = 45^\circ$$



$$\cot(-150)$$

$$= \cot 30$$

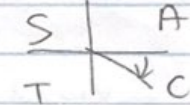
$$= \sqrt{3}$$



$$\tan -45$$

$$= -\tan 45$$

$$= -1$$



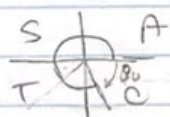
$$\csc 280$$

$$= \frac{1}{\sin 280}$$

$$\approx -1.0154$$

$$= -\sin 10^\circ$$

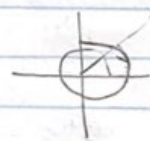
$$= -1.0154$$



$$\sin 450$$

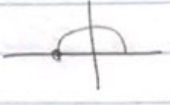
$$= \sin 90$$

$$= 1$$



$$\cos 180$$

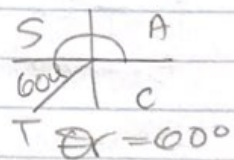
$$= -1$$

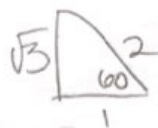
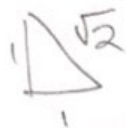


$$\sec 240^\circ$$

$$= -\sec 60^\circ$$

$$= -2$$





7.  $\cos \theta = \frac{1}{\sqrt{2}}$

$\theta_r = 45^\circ$   
 $\theta = 45^\circ, 315^\circ$

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

$\theta_r = 30^\circ$   
 $\theta = 210^\circ, 330^\circ$

$\tan \theta = \frac{3}{2}$    
 $\theta_r = \tan^{-1}(\frac{3}{2})$

$\theta_r = 56^\circ$   
 $\theta = 56^\circ, 236^\circ$

$\sin \theta = -1$   
 $\theta = 270^\circ$



$\cot \theta = \text{undefined}$   
 $\tan \theta = 0$   
 $\theta = 0^\circ, 180^\circ, 360^\circ$

$\cos \theta = -\frac{1}{\sqrt{3}}$    
 $\theta_r = 60^\circ$

$\theta = 120^\circ, 240^\circ$

$\sec \theta = \frac{2}{\sqrt{3}}$    
 $\cos \theta = \frac{\sqrt{3}}{2}$   
 $\theta_r = 30^\circ$

$\theta = 30^\circ, 330^\circ$

$\tan \theta = -1.2$    
 $\theta_r = \tan^{-1}(1.2)$   
 $\theta_r = 50^\circ$

$\theta = 130^\circ, 310^\circ$

$$= \frac{120}{343} - \frac{25}{24}$$

$$= \frac{2880 - 8575}{8232}$$

8.  $\sin \theta = \frac{5}{7}$

$y = 5$   
 $r = 7$   
 $x^2 = 49 - 25 \rightarrow x = \pm \sqrt{24}$   
 $x = \pm 2\sqrt{6}$

$\cos^2 \theta \sin \theta - \tan^2 \theta = -\frac{5695}{8232}$

$$= \left(\frac{-2\sqrt{6}}{7}\right)^2 \left(\frac{5}{7}\right) - \left(\frac{5}{-2\sqrt{6}}\right)^2$$

$$= \frac{4(6)(5)}{49(7)} - \frac{25}{4(6)} \rightarrow \frac{120}{343} - \frac{25}{24}$$

$$\frac{649}{343}$$

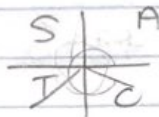
$$\sqrt{3} \frac{S}{T} \quad \sqrt{2} \frac{S}{T} \quad \frac{S}{T} \frac{A}{C}$$

$$9a) \cos 45^\circ \sin 225^\circ + \cos 330^\circ$$

$$= \left(\frac{1}{\sqrt{2}}\right) \left(-\frac{1}{\sqrt{2}}\right) + \frac{\sqrt{3}}{2}$$

$$= -\frac{1}{2} + \frac{\sqrt{3}}{2}$$

$$= \frac{\sqrt{3}-1}{2}$$



$$b) \csc 315^\circ \sin^2(-120^\circ) \cot 225^\circ$$

$$= -\left(\frac{\sqrt{2}}{1}\right) \left(-\frac{\sqrt{3}}{2}\right)^2 (1)$$

$$= -\sqrt{2} \left(\frac{3}{4}\right)$$

$$= -\frac{3\sqrt{2}}{4}$$