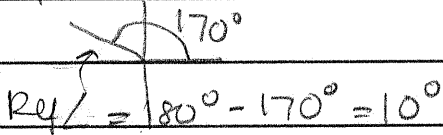
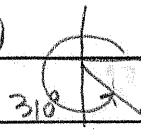


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CE 1. a)

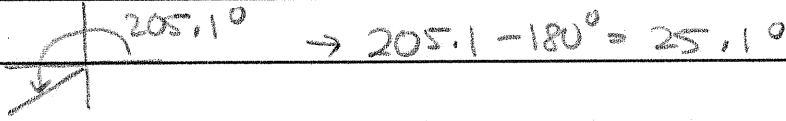


b)



$$360^\circ - 310^\circ = 50^\circ$$

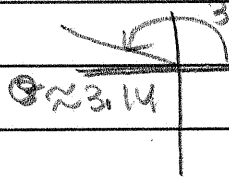
c)



$$\rightarrow 205.1 - 180^\circ = 25.1^\circ$$

d)

$$\theta = 3$$



$$\text{Ref } \angle = \pi - 3 \approx 0.14$$

2.

$\sin 70^\circ$  is pos

sine is also pos in Q II  $\rightarrow 180^\circ - 70^\circ = 110^\circ$

3.

$\cos 40^\circ$  is pos.

cos is also pos in Q IV  $\cdot 360^\circ - 40^\circ = 320^\circ$

4.

$\sin 170^\circ \rightarrow$  Q II  $\rightarrow \sin$  is +

$$\text{Ref } \angle: 180^\circ - 170^\circ = 10^\circ \rightarrow +\sin 10^\circ$$

b.

$\sin 330^\circ \rightarrow$  Q IV so  $\sin 330^\circ$  is negative

$$\text{Ref } \angle = 360^\circ - 330^\circ = 30^\circ \rightarrow -\sin 30^\circ$$

c.

$\sin(-15^\circ) = \sin(-15 + 360^\circ) = \sin 345^\circ \rightarrow$  Q IV  $\rightarrow \sin$  is  $\ominus$

$$\text{Ref } \angle: 360^\circ - 345^\circ = 15^\circ \rightarrow \ominus \sin 15^\circ$$

d.

$\sin(400^\circ) = \sin(400^\circ - 360^\circ) = \sin 40^\circ \rightarrow \oplus$

$$= +\sin 40^\circ$$

5.

$\cos 160^\circ \rightarrow$  Q II  $\rightarrow \cos$  is  $\ominus$

$$\text{Ref } \angle: 180^\circ - 160^\circ = 20^\circ \rightarrow \ominus \cos 20^\circ$$

b.

$\cos 182^\circ \rightarrow$  Q III  $\rightarrow \cos$  is  $\ominus$

$$\text{Ref } \angle = 182^\circ - 180^\circ = 2^\circ \rightarrow \ominus \cos 2^\circ$$

c.

$\cos(-100^\circ) = \cos(-100^\circ + 360^\circ) = \cos 260^\circ \rightarrow$  Q III  $\rightarrow \cos$  is  $\ominus$

$$\text{Ref } \angle: 260^\circ - 180^\circ = 80^\circ \rightarrow \ominus \cos 80^\circ$$

d.

$\cos(365^\circ) = \cos(365^\circ - 360^\circ) = \cos 5^\circ$

6a  $\sin 188^\circ = -0.1392$

(6b)  $\sin -110^\circ = -0.9397$

7a  $\cos 10.2^\circ = 0.9842$

(7b)  $\sin 28.6^\circ = 0.4787$

8a  $\sin 3 = 0.1411$

(8b)  $\cos 4 = -0.6536$

9a  $\cos 2.5 = -0.8011$

(9b)  $\cos (-0.73) = 0.7452$

10a



$\sin 45^\circ = \frac{\sqrt{2}}{2}$

;  $\sin 135^\circ$  Q II  $\rightarrow \sin 15^\circ \oplus$

Ref L =  $180^\circ - 135^\circ = 45^\circ$

$\rightarrow \sin 135^\circ = +\sin 45^\circ = \frac{\sqrt{2}}{2}$

(c)  $\sin 225^\circ \rightarrow$  Q III  $\rightarrow \sin 15^\circ \ominus$

Ref L:  $225^\circ - 180^\circ = 45^\circ$

$\sin 225^\circ = \ominus \sin 45^\circ = -\frac{\sqrt{2}}{2}$

(d)  $\sin 315^\circ \rightarrow$  Q IV  $\rightarrow \sin 15^\circ \ominus$

Ref L =  $360^\circ - 315^\circ = 45^\circ$

$\rightarrow \sin 315^\circ = -\sin 45^\circ = -\frac{\sqrt{2}}{2}$

(11)  $\cos 60^\circ = \frac{1}{2}$

(b)  $\cos 120^\circ \rightarrow$  Q II  $\rightarrow \cos 15^\circ \ominus$

Ref L =  $180^\circ - 120^\circ = 60^\circ$

$\cos 120^\circ = \ominus \cos 60^\circ = -\frac{1}{2}$



c s

(c)  $\cos 240^\circ \rightarrow$  Q III  $\rightarrow \cos \ominus$

Ref L:  $180^\circ - 240^\circ = 60^\circ$

$\cos 240^\circ = -\cos 60^\circ = -\frac{1}{2}$

(d)  $\cos 300^\circ \rightarrow$  Q IV  $\rightarrow \cos \oplus$

Ref L =  $360^\circ - 300^\circ = 60^\circ$

$\cos 300^\circ = +\cos 60^\circ = \frac{1}{2}$

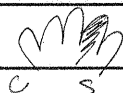
12  $\sin 30^\circ = \frac{1}{2}$

(b)  $\sin(-30^\circ) = \sin(-30^\circ + 360^\circ) = \sin 330^\circ$

$\rightarrow$  Q IV  $\rightarrow \sin 15^\circ \ominus$

Ref L =  $360^\circ - 330^\circ = 30^\circ$

$\sin(-30^\circ) = \ominus \sin 30^\circ = -\frac{1}{2}$



c s

(c)  $\cos 30^\circ = \frac{\sqrt{3}}{2}$

d  $\cos(-30^\circ) \rightarrow$  Q IV

Ref L =  $30^\circ$

$\cos(-30^\circ) = \cos 30^\circ = \frac{\sqrt{3}}{2}$

13  $\sin 330^\circ \rightarrow \text{Q IV} \rightarrow \sin \ominus$       (b)  $\cos 330^\circ \rightarrow \text{Q IV} \rightarrow \cos \oplus$   
 Ref  $\angle = 360^\circ - 330^\circ = 30^\circ$        $\cos 330^\circ = +\cos 30^\circ = \frac{\sqrt{3}}{2}$   
 $\sin 330^\circ = -\sin 30^\circ = -\frac{1}{2}$

c  $\sin \frac{7\pi}{6} \rightarrow \text{Q III} \rightarrow \sin \ominus$       (d)  $\cos \frac{7\pi}{6} \rightarrow \text{Q III} \rightarrow \cos \ominus$   
 $\sin \frac{7\pi}{6} = -\sin \frac{\pi}{6} = -\frac{1}{2}$        $\cos \frac{7\pi}{6} = \ominus \cos \frac{\pi}{6} = -\frac{\sqrt{3}}{2}$

14.  $\cos \frac{\pi}{4} = \frac{\sqrt{2}}{2}$       (b)  $\sin(-\frac{\pi}{3}) \rightarrow \text{Q IV} = -\sin \frac{\pi}{3} = \ominus \frac{\sqrt{3}}{2}$

c  $\cos \frac{5\pi}{6} \rightarrow \text{Q II} \rightarrow \cos \ominus$   
 $\cos \frac{5\pi}{6} = \ominus \cos \frac{\pi}{6} = -\frac{\sqrt{3}}{2}$

d  $\sin 300^\circ \rightarrow \text{Q IV} \rightarrow \sin \ominus$   
 Ref  $\angle = 360^\circ - 300^\circ = 60^\circ$   
 $\sin 300^\circ = \ominus \sin 60^\circ = -\frac{\sqrt{3}}{2}$

WE (a)  $\sin 128^\circ \rightarrow \text{Q II} \rightarrow \sin \oplus$        $\sin 128^\circ = \oplus \sin 52^\circ$   
 Ref  $\angle = 180^\circ - 128^\circ = 52^\circ$

(b)  $\cos 128^\circ \rightarrow \text{Q II} \rightarrow \cos \ominus$        $\cos 128^\circ = \ominus \cos 52^\circ$   
 Ref  $\angle = 180^\circ - 128^\circ = 52^\circ$

(c)  $\sin(-37^\circ) \Rightarrow \text{Q IV} : -37^\circ + 360^\circ = 323^\circ \rightarrow \text{Q IV} \rightarrow \sin \ominus$   
 Ref  $\angle : 360^\circ - 323^\circ = 37^\circ$   
 $\rightarrow \sin(-37^\circ) = -\sin 37^\circ$

(d)  $\cos 500^\circ : 500^\circ - 360^\circ = 140^\circ \rightarrow \text{Q II} \rightarrow \cos \ominus$   
 Ref  $\angle : 180^\circ - 140^\circ = 40^\circ \rightarrow \cos 500^\circ = \ominus \cos 40^\circ$

3a  $\cos 224.5^\circ \rightarrow \text{Q III} \rightarrow \cos \ominus$   $\rightarrow \cos 224.5^\circ = -\cos 44.5^\circ$   
 Ref C:  $224.5^\circ - 180^\circ = 44.5^\circ$

b  $\cos 658^\circ \rightarrow 658^\circ - 360^\circ = 298^\circ \rightarrow \text{Q IV} \rightarrow \cos \oplus$   $\rightarrow \cos 658^\circ = \cos 62^\circ$   
 Ref C:  $360^\circ - 298^\circ = 62^\circ$

c  $\sin 145.7^\circ \rightarrow \text{Q II} \rightarrow \sin \oplus$   $\rightarrow \sin 145.7^\circ = \sin 34.3^\circ$   
 Ref C:  $180^\circ - 145.7^\circ = 34.3^\circ$

d  $\sin(-201^\circ) = -201^\circ + 360^\circ = 159^\circ \rightarrow \text{Q II} \rightarrow \sin \oplus$   
 Ref:  $180^\circ - 159^\circ = 21^\circ \rightarrow \sin(-201^\circ) = \sin 21^\circ$

13  $\sin 150^\circ : \text{Q II} \rightarrow +\frac{1}{2}$

b  $\cos(-240^\circ) = \cos(-240^\circ + 360^\circ) = \cos 120^\circ \rightarrow \text{Q II} \rightarrow \ominus \frac{1}{2}$

c  $\sin(-135^\circ) = \sin(-135^\circ + 360^\circ) = \sin 225^\circ \rightarrow \text{Q III} \rightarrow \ominus \frac{\sqrt{2}}{2}$

d  $\cos(-30^\circ) = \cos(-30^\circ + 360^\circ) = \cos 330^\circ \rightarrow \text{Q IV} \rightarrow \frac{\sqrt{3}}{2}$

16  $\cos \frac{\pi}{4} \rightarrow \text{Q I} = \frac{\sqrt{2}}{2}$

b  $\sin(-\frac{\pi}{4}) \rightarrow \text{Q IV} \rightarrow \ominus \frac{\sqrt{2}}{2}$

c  $\sin \frac{5\pi}{3} \rightarrow \text{Q IV} \rightarrow -\frac{\sqrt{3}}{2}$

d  $\cos(-\frac{7\pi}{6} + 2\pi) = \cos(-\frac{7\pi}{6} + \frac{12\pi}{6}) = \cos \frac{5\pi}{6} \rightarrow \text{Q II} : -\frac{\sqrt{3}}{2}$

18  $\cos(-\frac{\pi}{3}) \rightarrow \text{Q IV} \rightarrow +\frac{1}{2}$

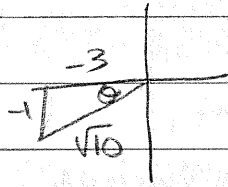
b  $\sin \pi \left( \frac{-110}{\pi} \right) = 0$

c  $\sin \frac{5\pi}{4} \rightarrow \text{Q III} = -\frac{\sqrt{2}}{2}$

d  $\sin(-\frac{\pi}{6}) \rightarrow \text{Q IV} = -\frac{1}{2}$

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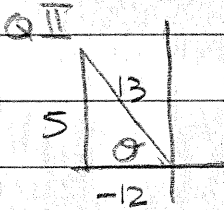


$$r = \sqrt{9+1} = \sqrt{10}$$

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

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

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$$\sin \theta = 5/13$$

$$\cos \theta = -12/13$$