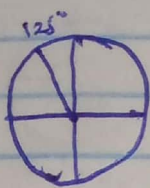


1 (A) $\sin 125$



$$125^\circ = -235^\circ = -235^\circ$$

(B) $\csc -100 = \frac{1}{\sin -100}$



$$-100^\circ = 260^\circ$$

$$\csc -100 = \frac{1}{\sin 260} = -1.0154$$

Reference angle = 260

2. (A) $\cos 28 = 0.8829$

(B) $\tan 39 = 0.8098$

(C) $\sec 67 = 2.5593$

(D) $\cot \frac{3\pi}{2} = 0$

3. (A) $\sin 120 \quad 120^\circ = -240^\circ$

$$\sin 120 = \sin -240$$

(B) $\sin 135 \quad 135^\circ = -(360-135) = -225^\circ$

$$\sin 135 = \sin -225$$

$$= \sin -225$$

(C) $\sec 150^\circ = \sec -210$

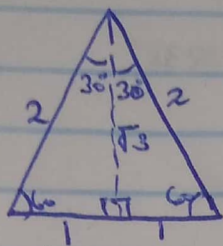
4. (A) $\sin^{-1} 0.75 = 48.6^\circ$

(B) $\cos^{-1} 4 = \emptyset$

(C) $\tan^{-1} \frac{5}{6} = 39.8^\circ$

(D) $\cos^{-1} -0.45 = 116.7^\circ$

5. From an equilateral triangle of dimensions 2

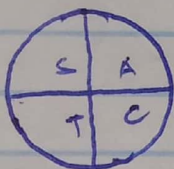


(a)

$$\frac{\sqrt{3}}{2} = \sin 60$$

$$\sin^{-1} [\sin 60] = 60^\circ$$

(b)



Cosine is negative in the 2nd and 3rd quadrant

$$\cos x = -1$$

$$\cos^{-1}(-1) = x = 180$$

(c) $\tan^{-1} \left[-\frac{1}{\sqrt{3}} \right]$

From the equilateral triangle,

$$\tan 30 = \frac{1}{\sqrt{3}}$$

$$\tan -30 = -\frac{1}{\sqrt{3}}$$

$$\tan^{-1} [\tan -30] = -30^\circ$$

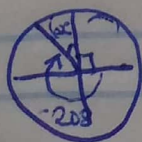
(d) $\cos^{-1} \left[-\frac{1}{2} \right]$

from the equilateral Δ

$$\cos 60 = \frac{1}{2} \therefore -\frac{1}{2} = \cos -60$$

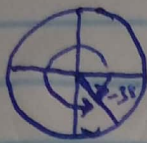
$$\cos^{-1} \left[-\frac{1}{2} \right] = \cos^{-1} [\cos (-60)] = -60^\circ$$

6. $\cos 152^\circ$



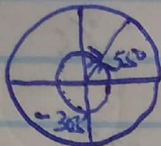
$$152 = -208^\circ$$

$$\tan(-38^\circ)$$



$$-38^\circ = +322^\circ$$

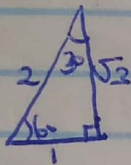
$$\sec 55^\circ = \frac{1}{\cos 55^\circ}$$



$$55^\circ = -305^\circ$$

$$7. \csc 150^\circ = \frac{1}{\sin 150^\circ}$$

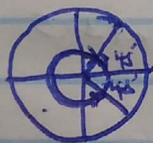
$$\sin[150^\circ] = \sin[180^\circ - 150^\circ] = \sin 30^\circ$$



$$\sin 30^\circ = \frac{1}{2} = 0.5$$

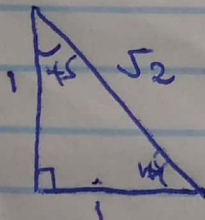
$$B) \tan 315^\circ$$

$$315^\circ = -45^\circ$$



$$\tan 315^\circ = \tan -45^\circ$$

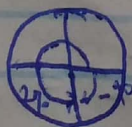
$$\tan -45^\circ = -\tan 45^\circ$$



$$\tan 45^\circ = 1$$

$$-\tan 45^\circ = -1$$

$$C) \cos \frac{3\pi}{2} = \cos 270^\circ$$

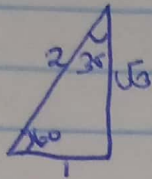


$$270^\circ = -90^\circ$$

$$\cos 270^\circ = \cos -90^\circ$$

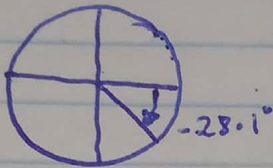
$$= -\cos 90^\circ = 0$$

$$\Rightarrow \sin \frac{2\pi}{3} = \sin 60$$



$$\sin 60 = \frac{\sqrt{3}}{2}$$

8.



$$\cot \theta = -\frac{15}{8} \quad \text{Since } \cot \theta = \frac{1}{\tan \theta}$$

$$\tan \theta = \frac{1}{\cot \theta} = -\frac{8}{15}$$

$$\tan^{-1} -\frac{8}{15} = -28.07^\circ$$

$$1^{\text{st}} \quad -28.1^\circ = 331.9^\circ$$

$$2^{\text{nd}} \text{ angle} = 331.9 + 360 = 691.9$$

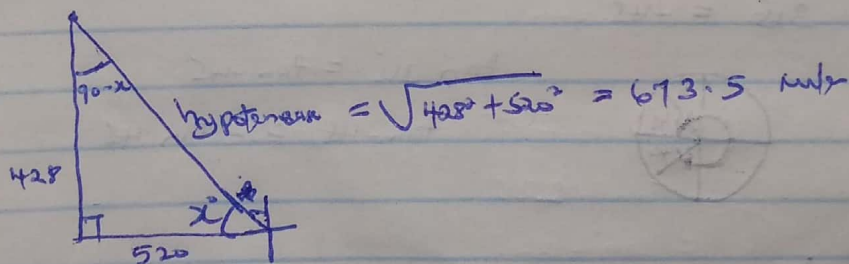
$$3^{\text{rd}} \text{ angle} = 691.9 + 360 = 1051.9$$

$$4^{\text{th}} \text{ angle} = 1051.9 + 360 = 1411.9$$

$$5^{\text{th}} \text{ angle} = 1411.9 + 360 = 1771.9$$

approximated
to one
d.p.

9.



$$\tan x = \frac{428}{520} = 0.856$$

$$\tan^{-1} 0.856 = x = 40.6^\circ$$

a)

$$\text{Angle travelled by the ship} = 90 - 40.6 = 49.4^\circ$$

$$\Rightarrow \text{Distance} = \text{hypotenuse} = \sqrt{428^2 + 520^2} = 673.48 \text{ m/s} = 673 \text{ m/s}$$