

Trigonometry Practice

1. $(5, -12)$
 x, y

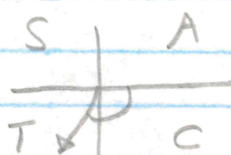
$$\sin \theta = \frac{y}{r} = \frac{-12}{13}$$
$$\cos \theta = \frac{x}{r} = \frac{5}{13}$$
$$\tan \theta = \frac{y}{x} = \frac{-12}{5}$$
$$r^2 = x^2 + y^2$$
$$r^2 = (5)^2 + (-12)^2$$
$$r^2 = 25 + 144$$
$$\sqrt{r^2} = \sqrt{169}$$
$$r = 13$$

2. a) $\sin(800^\circ)$



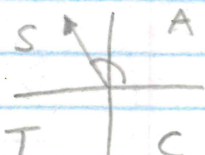
→ positive

b) $\cos(-120^\circ)$



→ negative

c) $\tan(120^\circ)$

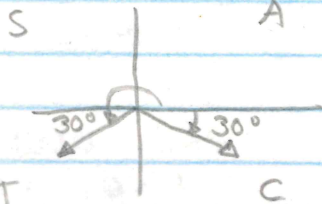


→ negative

3. a) $\sin \theta = -0.5$

$$\theta = \sin^{-1}(-0.5)$$

$$\theta = -30^\circ$$



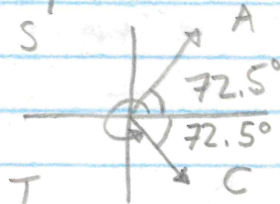
$$\theta_1 = 360^\circ - 30^\circ$$
$$= 330^\circ$$

$$\theta_2 = 210^\circ$$

b) $\cos \theta = 0.3$

$$\theta = \cos^{-1}(0.3)$$

$$\theta_1 \approx 72.5^\circ$$

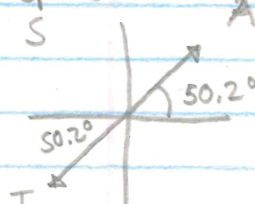


$$\theta_2 \approx 287.5^\circ$$

c) $\tan \theta = 1.2$

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

$$\theta_1 \approx 50.2^\circ$$

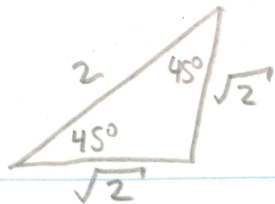
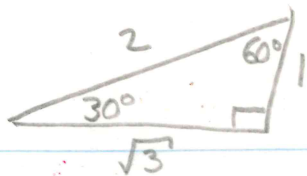


$$\theta_2 = 230.2^\circ$$

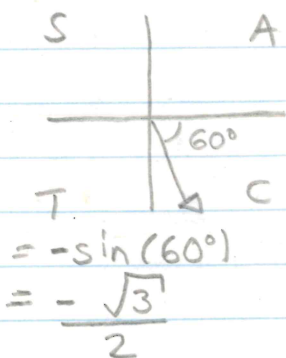
4.

$$\theta_1 = 125^\circ + 360^\circ = 485^\circ$$

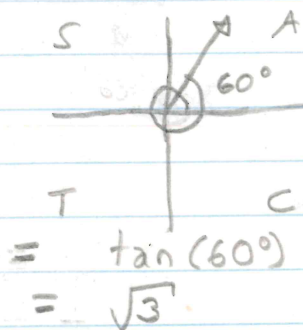
$$\theta_2 = 125^\circ - 360^\circ = -235^\circ$$



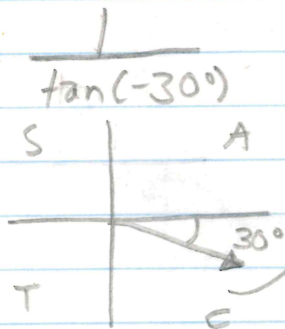
5. a) $\sin(300^\circ)$



b) $\tan(420^\circ)$

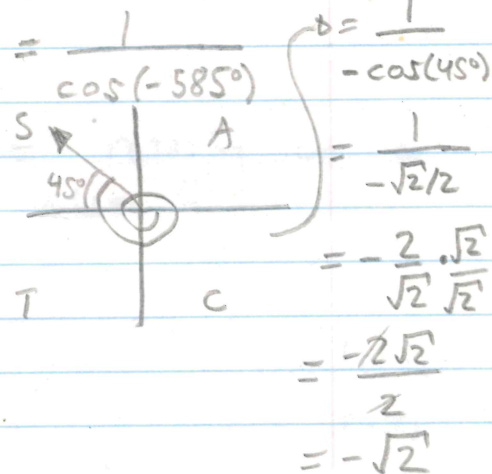


6. a) $\cot(-30^\circ)$



$= \frac{1}{\tan(-30^\circ)}$
 $= \frac{1}{-1/\sqrt{3}}$
 $= 1 \div -\frac{1}{\sqrt{3}}$
 $= 1 \times -\frac{\sqrt{3}}{1}$
 $= -\sqrt{3}$

b) $\sec(-585^\circ)$



7. a) $\sec \theta = 0.8$

$\frac{1}{\cos \theta} = 0.8$
 $0.8 \cos \theta = 1$
 $\cos \theta = \frac{1}{0.8}$

$\theta = \cos^{-1}\left(\frac{1}{0.8}\right)$

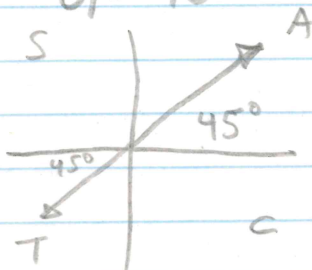
No Solⁿ

cannot be larger than 1

b) $\cot \theta = 1$

$\frac{1}{\tan \theta} = 1$
 $\tan \theta = 1$

$\theta = \tan^{-1}(1)$
 $\theta_1 = 45^\circ$



$\theta_2 = 180^\circ + 45^\circ$
 $= 225^\circ$

$$8a) \sin^2\theta + \cos^2\theta = 1$$

$$\text{L.S.} = \sin^2\theta + \cos^2\theta \quad \text{R.S.} = 1$$

$$= \frac{y^2}{r^2} + \frac{x^2}{r^2}$$

$$= \frac{x^2 + y^2}{r^2}$$

$$= \frac{r^2}{r^2}$$

$$= 1$$

$$\text{L.S.} = \text{R.S.}$$

QED

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

$$\text{L.S.} = \tan\theta \quad \text{R.S.} = \frac{y/r}{x/r}$$

$$= \frac{y}{x}$$

$$= \frac{y}{r} \div \frac{x}{r}$$

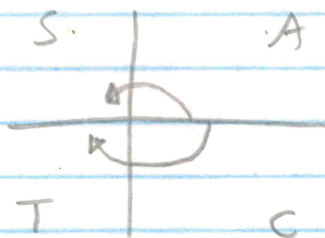
$$= \frac{y}{r} \cdot \frac{r}{x}$$

$$= \frac{y}{x}$$

$$\text{L.S.} = \text{R.S.}$$

QED

9.



Pattern rotating counter clockwise for cosine is +, -, -, +, etc...

Pattern rotating clockwise for cosine is also +, -, -, +, etc...

Related angles for $\cos\theta$ & $\cos(-\theta)$ are equal.

$$\therefore \cos\theta = \cos(-\theta)$$