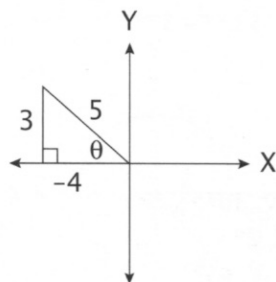


20.  $\tan \theta = \frac{10}{14}$   
 $\tan \theta \approx .7143$   
 $\theta = \arctan .7143 \approx 35.54^\circ$   
 $\alpha = 90^\circ - 35.54^\circ = 54.46^\circ$   
 $10^2 + 14^2 = D^2$   
 $100 + 196 = D^2$   
 $296 = D^2$   
 $\sqrt{296} = D$   
 $D \approx 17.20$

**Lesson 7A**

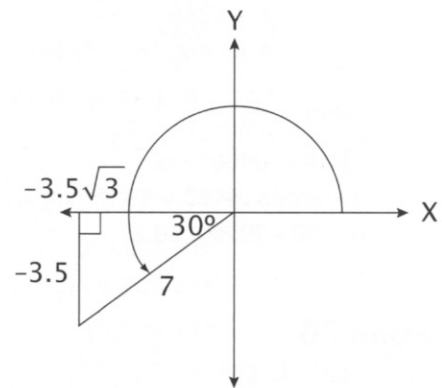
1.  $-330^\circ = I, 30^\circ$
2.  $-130^\circ = III, 50^\circ$
3.  $130^\circ = II, 50^\circ$
4.  $\cos 300^\circ = IV, 60^\circ, \frac{1}{2}$
5.  $\sin 405^\circ = I, 45^\circ, \frac{\sqrt{2}}{2}$
6.  $\tan 120^\circ = II, 60^\circ, -\sqrt{3}$
7.  $(-4, 3)$

$$\begin{aligned} \sin \theta &= \frac{3}{5} & \csc \theta &= \frac{5}{3} \\ \cos \theta &= \frac{-4}{5} & \sec \theta &= \frac{5}{-4} \\ \tan \theta &= \frac{3}{-4} & \cot \theta &= \frac{-4}{3} \end{aligned}$$



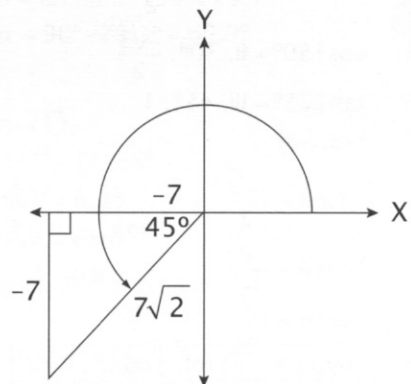
8.

hyp	$\theta$	ref	quad	$\sin \theta$	$\cos \theta$	$\tan \theta$
7	$210^\circ$	$30^\circ$	III	$-\frac{1}{2}$	$-\frac{\sqrt{3}}{2}$	$\frac{\sqrt{3}}{3}$



9.

hyp	$\theta$	ref	quad	$\sin \theta$	$\cos \theta$	$\tan \theta$
$7\sqrt{2}$	$225^\circ$	$45^\circ$	III	$-\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{2}}{2}$	1



10.  $\alpha = 90^\circ - 18^\circ = 72^\circ$

$$\sin 18^\circ = \frac{9}{Y}$$

$$Y \sin 18^\circ = 9$$

$$Y = \frac{9}{\sin 18^\circ} \approx 29.1$$

$$\tan 72^\circ = \frac{X}{9}$$

$$X = (9)(\tan 72^\circ)$$

$$X \approx 27.7$$

11.  $A^2 + 16^2 = 25^2$   
 $A^2 + 256 = 625$   
 $A^2 = 369$   
 $A = \sqrt{369}$   
 $A \approx 19.21$

$\sin \theta = \frac{16}{25}$   
 $\sin \theta = .6400$   
 $\theta = \arcsin .6400 \approx 39.8^\circ$   
 $\alpha = 90 - 39.8^\circ = 50.2^\circ$

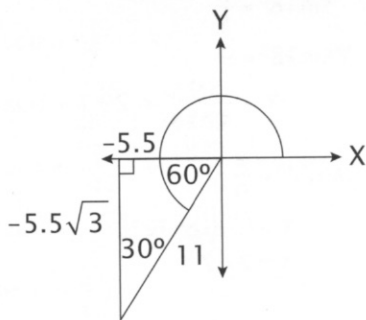
**Lesson 7B**

1.  $112^\circ = \text{II}, 68^\circ$
2.  $190^\circ = \text{III}, 10^\circ$
3.  $-50^\circ = \text{IV}, 50^\circ$
4.  $\sin 120^\circ = \text{II}, 60^\circ, \frac{\sqrt{3}}{2}$
5.  $\cos 150^\circ = \text{II}, 30^\circ, -\frac{\sqrt{3}}{2}$
6.  $\tan 225^\circ = \text{III}, 45^\circ, 1$
7.  $(-3, -3)$

$\sin \theta = \frac{-\sqrt{2}}{2}$        $\csc \theta = -\sqrt{2}$   
 $\cos \theta = \frac{-\sqrt{2}}{2}$        $\sec \theta = -\sqrt{2}$   
 $\tan \theta = 1$                $\cot \theta = 1$

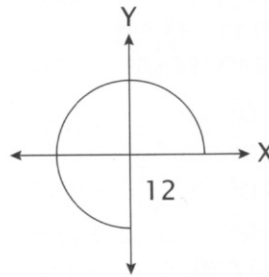
8.

hyp	$\theta$	ref	quad	$\sin \theta$	$\cos \theta$	$\tan \theta$
11	$240^\circ$	$60^\circ$	III	$-\frac{\sqrt{3}}{2}$	$-\frac{1}{2}$	$\sqrt{3}$



9.

hyp	$\theta$	ref	quad	$\sin \theta$	$\cos \theta$	$\tan \theta$
12	$270^\circ$	$90^\circ$	III	-1	0	undefined



10.  $\sin 28.6^\circ = \frac{B}{47}$   
 $B = (47)(\sin 28.6^\circ)$   
 $B \approx 22.5$

$\cos 28.6^\circ = \frac{A}{47}$   
 $A = (47)(\cos 28.6^\circ)$   
 $A \approx 41.27$

$\alpha = 90^\circ - 28.6^\circ = 61.4^\circ$

11.  $19^2 + 14.3^2 = Y^2$   
 $361 + 204.49 = Y^2$   
 $565.49 = Y^2$   
 $\sqrt{565.49} = Y$   
 $Y \approx 23.78$

$\tan \theta = \frac{19}{14.3} \approx 1.3287$

$\theta = \arctan 1.3287 \approx 53.0^\circ$

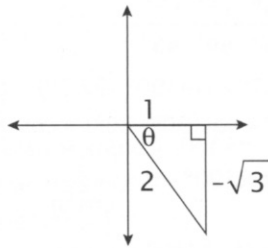
$\alpha = 90^\circ - 53.0^\circ = 37^\circ$

**Lesson 7C**

1.  $690^\circ = \text{IV}, 30^\circ$
2.  $178^\circ = \text{II}, 2^\circ$
3.  $-405^\circ = \text{IV}, 45^\circ$
4.  $\tan(-45^\circ) = \text{IV}, 45^\circ, -\frac{1}{1} = -1$
5.  $\cos 210^\circ = \text{III}, 30^\circ, -\frac{\sqrt{3}}{2}$
6.  $\sin 300^\circ = \text{IV}, 60^\circ, -\frac{\sqrt{3}}{2}$

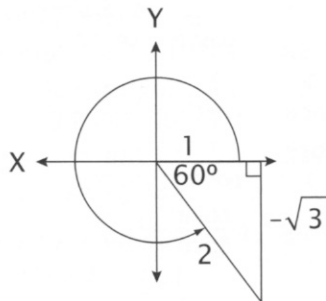
7.  $(+1, -\sqrt{3})$

$$\begin{aligned} \sin\theta &= -\frac{\sqrt{3}}{2} & \csc\theta &= -\frac{2\sqrt{3}}{3} \\ \cos\theta &= \frac{1}{2} & \sec\theta &= 2 \\ \tan\theta &= -\sqrt{3} & \cot\theta &= -\frac{\sqrt{3}}{3} \end{aligned}$$



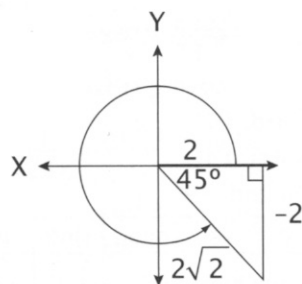
8.

hyp	$\theta$	ref	quad	$\sin\theta$	$\cos\theta$	$\tan\theta$
2	$300^\circ$	$60^\circ$	IV	$-\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$-\sqrt{3}$



9.

hyp	$\theta$	ref	quad	$\sin\theta$	$\cos\theta$	$\tan\theta$
$2\sqrt{2}$	$315^\circ$	$45^\circ$	IV	$-\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	-1



10.  $\tan 35.1^\circ = \frac{Q}{129}$   
 $Q = (129)(\tan 35.1^\circ)$   
 $Q \approx 90.66$

$$\begin{aligned} \cos 35.1^\circ &= \frac{129}{R} \\ R \cos 35.1^\circ &= 129 \\ R &= \frac{129}{\cos 35.1^\circ} \approx 157.7^\circ \\ \alpha &= 90^\circ - 35.1^\circ = 54.9^\circ \end{aligned}$$

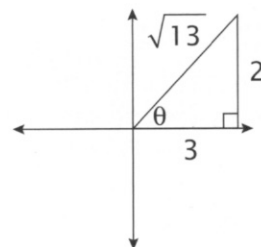
11.  $50^2 + 90^2 = H^2$   
 $2,500 + 8,100 = H^2$   
 $10,600 = H^2$   
 $\sqrt{10,600} = H$   
 $H \approx 102.96$

$$\begin{aligned} \tan\theta &= \frac{50}{90} \approx .5556 \\ \theta &= \arctan .5556 \approx 29.1^\circ \\ \alpha &= 90^\circ - 29.1^\circ = 60.9^\circ \end{aligned}$$

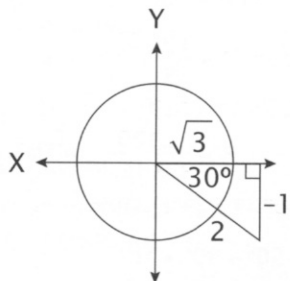
### Lesson 7D

- $272^\circ = \text{IV}, 88^\circ$
- $363^\circ = \text{I}, 3^\circ$
- $229^\circ = \text{III}, 49^\circ$
- $\cos(-30^\circ) = \text{IV}, 30^\circ, \frac{\sqrt{3}}{2}$
- $\sin 315^\circ = \text{IV}, 45^\circ, -\frac{\sqrt{2}}{2}$
- $\tan 135^\circ = \text{II}, 45^\circ, -1$
- $(3, 2)$

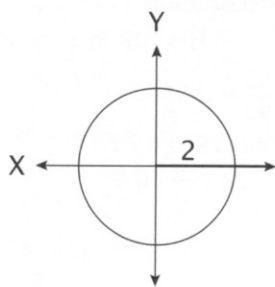
$$\begin{aligned} \sin\theta &= \frac{2\sqrt{13}}{13} & \csc\theta &= \frac{\sqrt{13}}{2} \\ \cos\theta &= \frac{3\sqrt{13}}{13} & \sec\theta &= \frac{\sqrt{13}}{3} \\ \tan\theta &= \frac{2}{3} & \cot\theta &= \frac{3}{2} \end{aligned}$$



8.	hyp	$\theta$	ref	quad	$\sin\theta$	$\cos\theta$	$\tan\theta$
	2	$330^\circ$	$30^\circ$	IV	$-\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{3}}{3}$



9.	hyp	$\theta$	ref	quad	$\sin\theta$	$\cos\theta$	$\tan\theta$
	2	$360^\circ$	$0^\circ$	IV	0	1	0



10.  $\sin 42.4^\circ = \frac{M}{66}$   
 $M = (66)(\sin 42.4^\circ)$   
 $M \approx 44.5$

$\cos 42.4^\circ = \frac{P}{66}$   
 $P = (66)(\cos 42.4^\circ)$   
 $P \approx 48.74$

$\alpha = 90^\circ - 42.4^\circ = 47.6^\circ$

11.  $X^2 + 10^2 = 30^2$   
 $X^2 + 100 = 900$   
 $X^2 = 800$   
 $X = \sqrt{800}$   
 $X \approx 28.28$

$\sin\theta = \frac{10}{30} \approx .3333$   
 $\theta = \arcsin .3333 \approx 19.47^\circ$   
 $\alpha = 90^\circ - 19.47^\circ = 70.53^\circ$

### Lesson 8A

1.  $\cos 49^\circ = \sin(90^\circ - 49^\circ) = \sin 41^\circ$   
 2.  $\sec 15^\circ 15' 15'' =$   
 $\sec(90^\circ - 15^\circ 15' 15'') = \csc 74^\circ 44' 45''$   

$$\begin{array}{r} 89^\circ 59' 60'' \\ 90^\circ 00' 00'' \\ - 15^\circ 15' 15'' \\ \hline 74^\circ 44' 45'' \end{array}$$

3.  $\tan 62.7^\circ = \cot(90^\circ - 62.7^\circ) = \cot 27.3^\circ$   
 4.  $\sin 80^\circ = \cos(90^\circ - 80^\circ) = \cos 10^\circ$

5.  $\sec\theta \csc(90^\circ - \theta) = \frac{1}{\cos^2\theta}$   
 $\sec\theta \sec\theta = \frac{1}{\cos^2\theta}$   
 $\sec^2\theta = \frac{1}{\cos^2\theta}$   
 $\frac{1}{\cos^2\theta} = \frac{1}{\cos^2\theta}$

6.  $\frac{1}{\sec\theta} \cdot \frac{1}{\cos\theta} = 1$   
 $\frac{\cos\theta}{1} \cdot \frac{1}{\cos\theta} = 1$   
 $\frac{\cos\theta}{\cos\theta} = 1$   
 $1 = 1$

7.  $\cot\alpha \cos(90^\circ - \alpha) = \cos\alpha$   
 $\cot\alpha \sin\alpha = \cos\alpha$   
 $\frac{\cos\alpha}{\sin\alpha} \cdot \frac{\sin\alpha}{1} = \cos\alpha$   
 $\frac{\cos\alpha}{1} = \cos\alpha$   
 $\cos\alpha = \cos\alpha$

8.  $195^\circ = 3\text{rd}, 15^\circ$   
 9.  $346^\circ = 4\text{th}, 14^\circ$   
 10.  $-229^\circ = 2\text{nd}, 49^\circ$

11.	hyp	$\theta$	ref	quad	$\sin\theta$	$\cos\theta$	$\tan\theta$
	5	$30^\circ$	$30^\circ$	I	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{3}}{3}$

12.	hyp	$\theta$	ref	quad	$\sin\theta$	$\cos\theta$	$\tan\theta$
	$3\sqrt{2}$	$225^\circ$	$45^\circ$	III	$-\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{2}}{2}$	1

13.	hyp	$\theta$	ref	quad	$\sin\theta$	$\cos\theta$	$\tan\theta$
	4	$780^\circ$	$60^\circ$	I	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$