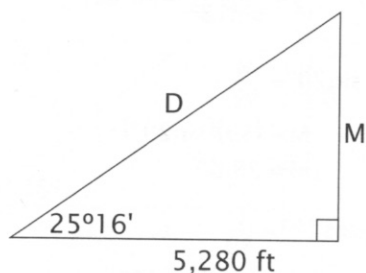


Lesson 6A

$$\begin{aligned}
 1. \quad \cos 25^\circ 16' &= \frac{5,280}{D} \\
 D \cos 25^\circ 16' &= 5,280 \\
 D &= \frac{5,280}{\cos 25^\circ 16'} \\
 D &\approx 5,838.77 \text{ ft}
 \end{aligned}$$



$$\begin{aligned}
 2. \quad \tan 25^\circ 16' &= \frac{M}{5,280} \\
 M &= (5,280)(\tan 25^\circ 16') \\
 M &\approx 2,492.09 \text{ ft} \\
 3. \quad \csc \theta &= \frac{2\sqrt{31}}{4} = \frac{\sqrt{31}}{2} \\
 4. \quad \sec \theta &= \frac{2\sqrt{31}}{6\sqrt{3}} = \frac{\sqrt{31}}{3\sqrt{3}} = \frac{\sqrt{31}\sqrt{3}}{3\sqrt{3}\sqrt{3}} = \frac{\sqrt{93}}{9} \\
 5. \quad \cot \theta &= \frac{6\sqrt{3}}{4} = \frac{3\sqrt{3}}{2} \\
 6. \quad \csc \alpha &= \frac{\sqrt{93}}{9} \\
 7. \quad \sec \alpha &= \frac{\sqrt{31}}{2} \\
 8. \quad \cot \alpha &= \frac{2\sqrt{3}}{9} \\
 9. \quad \sin \theta &= \frac{4}{2\sqrt{31}} \approx .3592 \\
 10. \quad \cos \theta &= \frac{6\sqrt{3}}{2\sqrt{31}} \approx .9333 \\
 11. \quad \tan \theta &= \frac{4}{6\sqrt{3}} \approx .3849 \\
 12. \quad \sin \alpha &= \frac{6\sqrt{3}}{2\sqrt{31}} \approx .9333 \\
 13. \quad \cos \alpha &= \frac{4}{2\sqrt{31}} \approx .3592 \\
 14. \quad \tan \alpha &= \frac{6\sqrt{3}}{4} \approx 2.5981 \\
 15. \quad \arcsin .3592 &\approx 21.05^\circ
 \end{aligned}$$

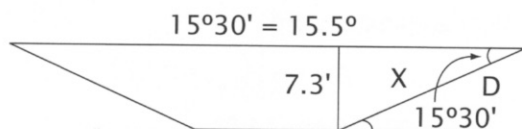
$$\begin{aligned}
 16. \quad \arcsin .9333 &\approx 68.96^\circ \\
 17. \quad \tan 54.6^\circ &= \frac{B}{12} \\
 B &= (12)(\tan 54.6^\circ) \approx 16.89 \\
 \sin 35.4^\circ &= \frac{12}{A} \\
 A \sin 35.4^\circ &= 12 \\
 A &= \frac{12}{\sin 35.4^\circ} \approx 20.72 \\
 \alpha &= 90^\circ - 35.4^\circ = 54.6^\circ \\
 18. \quad \sin 61^\circ &= \frac{D}{59} \\
 D &= (59)(\sin 61^\circ) \approx 51.6 \\
 \cos 61^\circ &= \frac{C}{59} \\
 C &= (59)(\cos 61^\circ) \approx 28.6 \\
 \alpha &= 90^\circ - 29^\circ = 61^\circ \\
 19. \quad \tan 47.34^\circ &= \frac{F}{100} \\
 F &= (100)(\tan 47.34^\circ) \\
 F &\approx 108.52 \\
 \sin 42.66^\circ &= \frac{100}{E} \\
 E \sin 42.66^\circ &= 100 \\
 E &= \frac{100}{\sin 42.66^\circ} \approx 147.57 \\
 \alpha &= 90^\circ - 42.66^\circ = 47.34^\circ \\
 20. \quad \tan 41.54^\circ &= \frac{G}{47} \\
 G &= (47)(\tan 41.54^\circ) \approx 41.64 \\
 \cos 41.54^\circ &= \frac{47}{H} \\
 H \cos 41.54^\circ &= 47 \\
 H &= \frac{47}{\cos 41.54^\circ} \approx 62.79 \\
 \alpha &= 90^\circ - 41^\circ 32' 10'' = 48^\circ 27' 50'' \\
 \theta &\approx 41.54^\circ
 \end{aligned}$$

Lesson 6B

1. $15^\circ 30' = 15.5^\circ$

$$\sin 15.5^\circ = \frac{7.3}{X}$$

$$X = \frac{7.3}{\sin 15.5^\circ} \approx 27.32 \text{ ft}$$

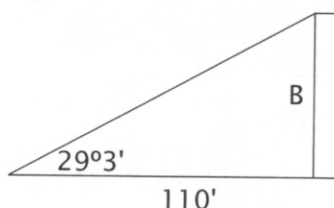


2. $29^\circ 3' \approx 29.05^\circ$

$$\tan 29.05^\circ = \frac{B}{110}$$

$$B = (110)(\tan 29.05^\circ)$$

$$B \approx 61.1 \text{ ft}$$



3. $\csc \theta = \frac{11}{4.6} = \frac{110}{46} = \frac{55}{23}$

4. $\sec \theta = \frac{11}{10}$

5. $\cot \theta = \frac{10}{4.6} = \frac{100}{46} = \frac{50}{23}$

6. $\csc \alpha = \frac{11}{10}$

7. $\sec \alpha = \frac{11}{4.6} = \frac{110}{46} = \frac{55}{23}$

8. $\cot \alpha = \frac{4.6}{10} = \frac{46}{100} = \frac{23}{50}$

9. $\sin \theta = \frac{4.6}{11} \approx .4182$

10. $\cos \theta = \frac{10}{11} \approx .9091$

11. $\tan \theta = \frac{4.6}{10} = .4600$

12. $\sin \alpha = \frac{10}{11} \approx .9091$

13. $\cos \alpha = \frac{4.6}{11} \approx .4182$

14. $\tan \alpha = \frac{10}{4.6} \approx 2.1739$

15. $\arcsin .4182 \approx 24.7^\circ$

16. $\arcsin .9091 \approx 65.4^\circ$

17. $\tan 72^\circ = \frac{K}{12}$

$$K = (12)(\tan 72^\circ)$$

$$K \approx 36.93$$

$$\sin 18^\circ = \frac{12}{J}$$

$$J = \frac{12}{\sin 18^\circ} \approx 38.83$$

18. $\sin 29^\circ = \frac{M}{59}$

$$M = (59)(\sin 29^\circ)$$

$$M \approx 28.60$$

$$\cos 29^\circ = \frac{L}{59}$$

$$L = (59)(\cos 29^\circ)$$

$$L \approx 51.60$$

19. $\sin 23^\circ = \frac{10.25}{N}$

$$N \sin 23^\circ = 10.25$$

$$N = \frac{10.25}{\sin 23^\circ} \approx 26.23$$

$$\tan 67^\circ = \frac{P}{10.25}$$

$$P = (10.25)(\tan 67^\circ)$$

$$P \approx 24.15$$

20. $2\sqrt{13} \approx 7.21$

$$\tan \theta \approx \frac{7.21}{6}$$

$$\arctan \theta \approx 1.2017$$

$$\theta \approx 50.23^\circ$$

$$\alpha \approx 90^\circ - 50.23^\circ$$

$$\alpha \approx 39.77^\circ$$

$$\sin 39.77^\circ = \frac{6}{Q}$$

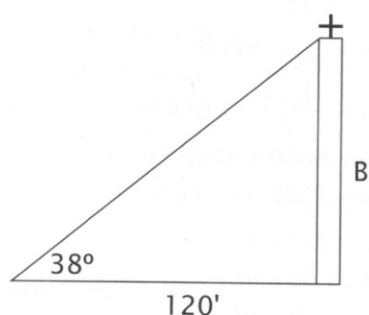
$$Q = \frac{6}{\sin 39.77^\circ}$$

$$Q \approx \frac{6}{.6397}$$

$$Q \approx 9.38$$

Lesson 6C

$$\begin{aligned}
 1. \quad \tan 43^\circ &= \frac{C}{120} \\
 C &= (120)(\tan 43^\circ) \\
 C &\approx 111.90 \text{ ft}
 \end{aligned}$$



$$\begin{aligned}
 2. \quad \tan 38^\circ &= \frac{B}{120} \\
 B &= (120)(\tan 38^\circ) \\
 B &\approx 93.75 \text{ ft}
 \end{aligned}$$

height of cross:
 $111.90 - 93.75 = 18.15 \text{ ft}$

$$3. \quad \csc \theta = \frac{15}{7.1} = \frac{150}{71}$$

$$4. \quad \sec \theta = \frac{15}{13.2} = \frac{150}{132} = \frac{25}{22}$$

$$3. \quad \csc \theta = \frac{15}{7.1} = \frac{150}{71}$$

$$4. \quad \sec \theta = \frac{15}{13.2} = \frac{150}{132} = \frac{25}{22}$$

$$5. \quad \cot \theta = \frac{13.2}{7.1} = \frac{132}{71}$$

$$6. \quad \csc \alpha = \frac{15}{13.2} = \frac{150}{132} = \frac{25}{22}$$

$$7. \quad \sec \alpha = \frac{15}{7.1} = \frac{150}{71}$$

$$8. \quad \cot \alpha = \frac{7.1}{13.2} = \frac{71}{132}$$

$$9. \quad \sin \theta = \frac{7.1}{15} \approx .4733$$

$$10. \quad \cos \theta = \frac{13.2}{15} = .8800$$

$$11. \quad \tan \theta = \frac{7.1}{13.2} \approx .5379$$

$$12. \quad \sin \alpha = \frac{13.2}{15} = .8800$$

$$13. \quad \cos \alpha = \frac{7.1}{15} \approx .4733$$

$$14. \quad \tan \alpha = \frac{13.2}{7.1} \approx 1.8592$$

$$15. \quad \arcsin .4733 \approx 28.25^\circ$$

$$16. \quad \arcsin .8800 \approx 61.64^\circ$$

$$\begin{aligned}
 17. \quad \sin 40^\circ &= \frac{R}{25} \\
 R &= (25)(\sin 40^\circ) \\
 R &\approx 16.07
 \end{aligned}$$

$$\begin{aligned}
 \cos 40^\circ &= \frac{S}{25} \\
 S &= (25)(\cos 40^\circ) \\
 S &\approx 19.15
 \end{aligned}$$

$$\begin{aligned}
 18. \quad \tan 53.8^\circ &= \frac{U}{88} \\
 U &= (88)(\tan 53.8^\circ) \\
 U &\approx 120.24
 \end{aligned}$$

$$\begin{aligned}
 \sin 36.2^\circ &= \frac{88}{T} \\
 T \sin 36.2^\circ &= 88 \\
 T &= \frac{88}{\sin 36.2^\circ} \approx 149.00
 \end{aligned}$$

$$\begin{aligned}
 19. \quad \tan 38.1^\circ &= \frac{W}{150} \\
 W &= (150)(\tan 38.1^\circ) \\
 W &\approx 117.62
 \end{aligned}$$

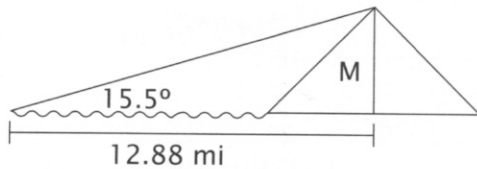
$$\begin{aligned}
 \sin 51.9^\circ &= \frac{150}{V} \\
 V \sin 51.9^\circ &= 150 \\
 V &= \frac{150}{\sin 51.9^\circ} \approx 190.61
 \end{aligned}$$

$$\begin{aligned}
 20. \quad 7^2 + X^2 &= (\sqrt{95})^2 \\
 49 + X^2 &= 95 \\
 X^2 &= 46 \\
 X &= \sqrt{46} \\
 X &\approx 6.78
 \end{aligned}$$

$$\begin{aligned}
 \tan \theta &= \frac{6.78}{7} \\
 \tan \theta &\approx .9686 \\
 \theta &= \arctan .9686 \\
 \theta &\approx 44.1^\circ \\
 \alpha &= 90 - 44.1^\circ = 45.9^\circ
 \end{aligned}$$

Lesson 6D

$$\begin{aligned}
 1. \quad \tan 15.5^\circ &= \frac{M}{12.88} \\
 M &= (12.88)(\tan 15.5^\circ) \\
 M &\approx 3.57 \text{ mi}
 \end{aligned}$$



$$\begin{aligned}
 2. \quad \tan 64.75^\circ &= \frac{B}{60.7} \\
 B &= (60.7)(\tan 64.75^\circ) \\
 B &\approx 128.7 \text{ ft}
 \end{aligned}$$



$$\begin{aligned}
 3. \quad (18.33)^2 + X^2 &= 25^2 \\
 336 + X^2 &= 625 \\
 X^2 &= 289 \\
 X &= 17
 \end{aligned}$$

$$\csc \theta = \frac{25}{17}$$

$$4. \quad \sec \theta = \frac{25}{18.33} = \frac{2500}{1833}$$

$$5. \quad \cot \theta = \frac{18.33}{17} = \frac{1833}{1700}$$

$$6. \quad \csc \alpha = \frac{25}{18.33} = \frac{2500}{1833}$$

$$7. \quad \sec \alpha = \frac{25}{17}$$

$$8. \quad \cot \alpha = \frac{17}{18.33} = \frac{1700}{1833}$$

$$9. \quad \sin \theta = \frac{17}{25} = .6800$$

$$10. \quad \cos \theta = \frac{18.33}{25} = .7332$$

$$11. \quad \tan \theta = \frac{17}{18.33} \approx .9274$$

$$12. \quad \sin \alpha = \frac{18.33}{25} = .7332$$

$$13. \quad \cos \alpha = \frac{17}{25} = .6800$$

$$14. \quad \tan \alpha = \frac{18.33}{17} \approx 1.0782$$

$$15. \quad \arcsin .6800 \approx 42.84^\circ$$

$$16. \quad \arcsin .7332 \approx 47.16^\circ$$

$$17. \quad 2^2 + 2.24^2 = Y^2$$

$$4 + 5.00 = Y^2$$

$$9 = Y^2$$

$$Y = 3$$

$$\cos \theta = \frac{2}{3} \approx .6667$$

$$\theta = \arccos .6667 \approx 48.19^\circ$$

$$\alpha = 90^\circ - 48.19^\circ = 41.81^\circ$$

$$\begin{aligned}
 18. \quad \tan 40.8^\circ &= \frac{A}{10.5} \\
 A &= (10.5)(\tan 40.8^\circ) \\
 A &\approx 9.06
 \end{aligned}$$

$$\sin 49.2^\circ = \frac{10.5}{Z}$$

$$Z \sin 49.2^\circ = 10.5$$

$$Z = \frac{10.5}{\sin 49.2^\circ} \approx 13.87$$

$$\alpha = 90^\circ - 49.2^\circ = 40.8^\circ$$

$$\begin{aligned}
 19. \quad \tan 29.07^\circ &= \frac{C}{56} \\
 C &= (56)(\tan 29.07^\circ) \\
 C &\approx 31.13
 \end{aligned}$$

$$\cos 29.07^\circ = \frac{56}{B}$$

$$B \cos 29.07^\circ = 56$$

$$B = \frac{56}{\cos 29.07^\circ} \approx 64.07$$

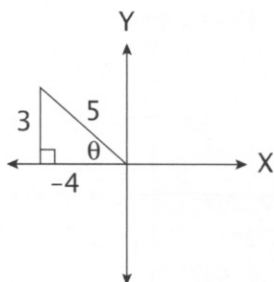
$$\alpha = 90^\circ - 29.07^\circ = 60.93^\circ$$

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

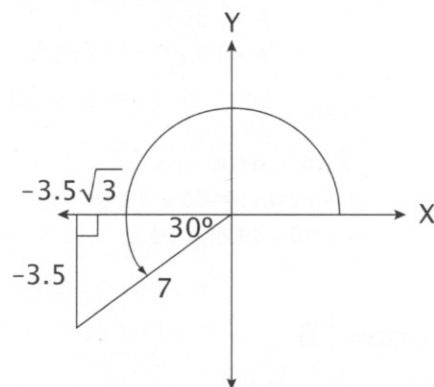
1. $-330^\circ = I, 30^\circ$
2. $-130^\circ = III, 50^\circ$
3. $130^\circ = II, 50^\circ$
4. $\cos 300^\circ = IV, 60^\circ, \frac{1}{2}$
5. $\sin 405^\circ = I, 45^\circ, \frac{\sqrt{2}}{2}$
6. $\tan 120^\circ = II, 60^\circ, -\sqrt{3}$
7. $(-4, 3)$

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



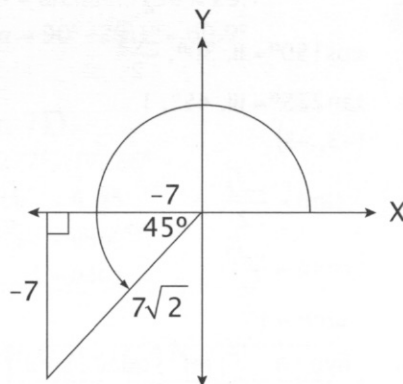
8.

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



9.

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



10. $\alpha = 90^\circ - 18^\circ = 72^\circ$
 $\sin 18^\circ = \frac{9}{Y}$
 $Y \sin 18^\circ = 9$
 $Y = \frac{9}{\sin 18^\circ} \approx 29.1$
 $\tan 72^\circ = \frac{X}{9}$
 $X = (9)(\tan 72^\circ)$
 $X \approx 27.7$