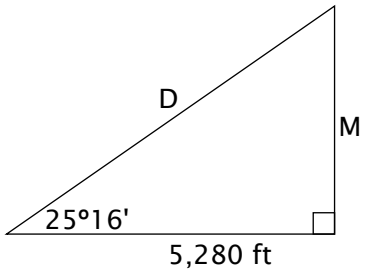
Lesson 6A

1. $\cos 25°16' = \dfrac{5{,}280}{D}$

$D\cos 25°16' = 5{,}280$

$D = \dfrac{5{,}280}{\cos 25°16'}$

$D \approx 5{,}838.77 \text{ ft}$



2. $\tan 25°16' = \dfrac{M}{5{,}280}$

$M = (5{,}280)(\tan 25°16')$

$M \approx 2{,}492.09 \text{ ft}$

3. $\csc\theta = \dfrac{2\sqrt{31}}{4} = \dfrac{\sqrt{31}}{2}$

4. $\sec\theta = \dfrac{2\sqrt{31}}{6\sqrt{3}} = \dfrac{\sqrt{31}}{3\sqrt{3}} = \dfrac{\sqrt{31}\sqrt{3}}{3\sqrt{3}\sqrt{3}} = \dfrac{\sqrt{93}}{9}$

5. $\cot\theta = \dfrac{6\sqrt{3}}{4} = \dfrac{3\sqrt{3}}{2}$

6. $\csc\alpha = \dfrac{\sqrt{93}}{9}$

7. $\sec\alpha = \dfrac{\sqrt{31}}{2}$

8. $\cot\alpha = \dfrac{2\sqrt{3}}{9}$

9. $\sin\theta = \dfrac{4}{2\sqrt{31}} \approx .3592$

10. $\cos\theta = \dfrac{6\sqrt{3}}{2\sqrt{31}} \approx .9333$

11. $\tan\theta = \dfrac{4}{6\sqrt{3}} \approx .3849$

12. $\sin\alpha = \dfrac{6\sqrt{3}}{2\sqrt{31}} \approx .9333$

13. $\cos\alpha = \dfrac{4}{2\sqrt{31}} \approx .3592$

14. $\tan\alpha = \dfrac{6\sqrt{3}}{4} \approx 2.5981$

15. $\arcsin .3592 \approx 21.05°$

16. $\arcsin .9333 \approx 68.96°$

17. $\tan 54.6° = \dfrac{B}{12}$

$B = (12)(\tan 54.6°) \approx 16.89$

$\sin 35.4° = \dfrac{12}{A}$

$A\sin 35.4° = 12$

$A = \dfrac{12}{\sin 35.4°} \approx 20.72$

$\alpha = 90 - 35.4° = 54.6°$

18. $\sin 61° = \dfrac{D}{59}$

$D = (59)(\sin 61°) \approx 51.6$

$\cos 61° = \dfrac{C}{59}$

$C = (59)(\cos 61°) \approx 28.6$

$\alpha = 90° - 29° = 61°$

19. $\tan 47.34° = \dfrac{F}{100}$

$F = (100)(\tan 47.34°)$

$F \approx 108.52$

$\sin 42.66° = \dfrac{100}{E}$

$E\sin 42.66° = 100$

$E = \dfrac{100}{\sin 42.66°} \approx 147.57$

$\alpha = 90° - 42.66° = 47.34°$

20. $\tan 41.54° = \dfrac{G}{47}$

$G = (47)(\tan 41.54°) \approx 41.64$

$\cos 41.54° = \dfrac{47}{H}$

$H\cos 41.54° = 47$

$H = \dfrac{47}{\cos 41.54°} \approx 62.79$

$\alpha = 90° - 41°32'10'' = 48°27'50''$

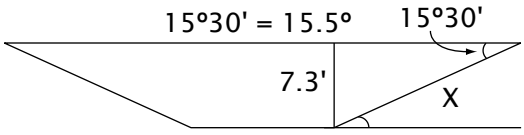
$\theta \approx 41.54°$

Lesson 6B

1. $15°30' = 15.5°$

$$\sin 15.5° = \frac{7.3}{X}$$

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

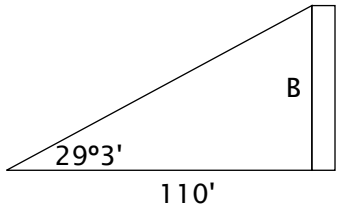


2. $29°3' \approx 29.05°$

$$\tan 29.05° = \frac{B}{110}$$

$$B = (110)(\tan 29.05°)$$

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



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. $\arcsin .4182 \approx 24.7°$
16. $\arcsin .9091 \approx 65.4°$
17. $\tan 72° = \frac{K}{12}$

$$K = (12)(\tan 72°)$$

$$K \approx 36.93$$

$$\sin 18° = \frac{12}{J}$$

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

18. $\sin 29° = \frac{M}{59}$

$$M = (59)(\sin 29°)$$

$$M \approx 28.60$$

$$\cos 29° = \frac{L}{59}$$

$$L = (59)(\cos 29°)$$

$$L \approx 51.60$$

19. $\sin 23° = \frac{10.25}{N}$

$$N\sin 23° = 10.25$$

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

$$\tan 67° = \frac{P}{10.25}$$

$$P = (10.25)(\tan 67°)$$

$$P \approx 24.15$$

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

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

$$\arctan\theta \approx 1.2017$$

$$\theta \approx 50.23°$$

$$\alpha \approx 90° - 50.23°$$

$$\alpha \approx 39.77°$$

$$\sin 39.77° = \frac{6}{Q}$$

$$Q = \frac{6}{\sin 39.77°}$$

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

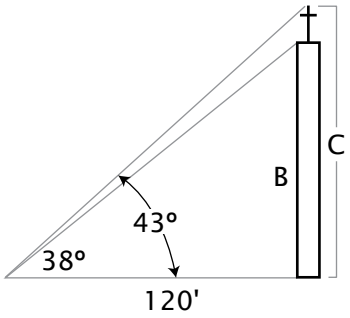
$$Q \approx 9.38$$

Lesson 6C

1. $\tan 43^\circ = \frac{C}{120}$

$C = (120)(\tan 43^\circ)$

$C \approx 111.90$ ft



2. $\tan 38^\circ = \frac{B}{120}$

$B = (120)(\tan 38^\circ)$

$B \approx 93.75$ ft

height of cross:

$111.90 - 93.75 = 18.15$ ft

3. $\csc\theta = \frac{15}{7.1} = \frac{150}{71}$
4. $\sec\theta = \frac{15}{13.2} = \frac{150}{132} = \frac{25}{22}$
5. $\cot\theta = \frac{13.2}{7.1} = \frac{132}{71}$
6. $\csc\alpha = \frac{15}{13.2} = \frac{150}{132} = \frac{25}{22}$
7. $\sec\alpha = \frac{15}{7.1} = \frac{150}{71}$
8. $\cot\alpha = \frac{7.1}{13.2} = \frac{71}{132}$
9. $\sin\theta = \frac{7.1}{15} \approx .4733$
10. $\cos\theta = \frac{13.2}{15} = .8800$
11. $\tan\theta = \frac{7.1}{13.2} \approx .5379$
12. $\sin\alpha = \frac{13.2}{15} = .8800$
13. $\cos\alpha = \frac{7.1}{15} \approx .4733$
14. $\tan\alpha = \frac{13.2}{7.1} \approx 1.8592$
15. $\arcsin .4733 \approx 28.25^\circ$
16. $\arcsin .8800 \approx 61.64^\circ$
17. $\sin 40^\circ = \frac{R}{25}$

$R = (25)(\sin 40^\circ)$

$R \approx 16,07$

$\cos 40^\circ = \frac{S}{25}$

$S = (25)(\cos 40^\circ)$

$S \approx 19,15$

$\alpha = 90^\circ - 40^\circ$

$\alpha = 50^\circ$

18. $\alpha = 90^\circ - 36,2^\circ$

$\alpha = 53,8^\circ$

$\tan 53,8^\circ = \frac{U}{88}$

$U = (88)(\tan 53,8^\circ)$

$U \approx 120,24$

$\sin 36,2^\circ = \frac{88}{T}$

$T \sin 36,2^\circ = 88$

$T = \frac{88}{\sin 36,2^\circ} \approx 149,00$

19. $\alpha = 90^\circ - 51,9^\circ$

$\alpha = 38,1^\circ$

$\tan 38,1^\circ = \frac{W}{150}$

$W = (150)(\tan 38,1^\circ)$

$W \approx 117,62$

$\sin 51,9^\circ = \frac{150}{V}$

$V \sin 51,9^\circ = 150$

$V = \frac{150}{\sin 51,9^\circ} \approx 190,61$

20. $7^2 + X^2 = \left(\sqrt{95}\right)^2$

$49 + X^2 = 95$

$X^2 = 46$

$X = \sqrt{46}$

$X \approx 6.78$

$\tan\theta = \frac{6.78}{7}$

$\tan\theta \approx .9686$

$\theta = \arctan .9686$

$\theta \approx 44.1^\circ$

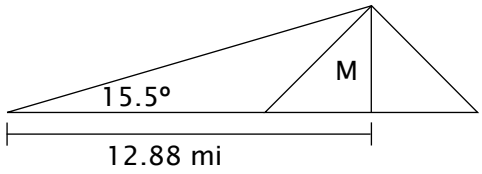
$\alpha = 90 - 44.1^\circ = 45.9^\circ$

Lesson 6D

1. $\tan 15.5^\circ = \dfrac{M}{12.88}$

$M = (12.88)(\tan 15.5^\circ)$

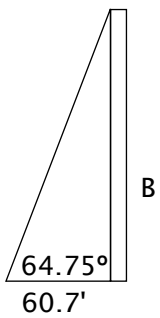
$M \approx 3.57$ mi



2. $\tan 64.75^\circ = \dfrac{B}{60.7}$

$B = (60.7)(\tan 64.75^\circ)$

$B \approx 128.7$ ft



3. $(18.33)^2 + X^2 = 25^2$

$336 + X^2 = 625$

$X^2 = 289$

$X = 17$

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

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

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

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

7. $\sec\alpha = \dfrac{25}{17}$

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

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

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

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

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

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

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

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

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

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

$4 + 5.00 = Y^2$

$9 = Y^2$

$Y = 3$

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

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

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

18. $\tan 40.8^\circ = \dfrac{A}{10.5}$

$A = (10.5)(\tan 40.8^\circ)$

$A \approx 9.06$

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

$Z\sin 49.2^\circ = 10.5$

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

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

19. $\tan 29.07^\circ = \dfrac{C}{56}$

$C = (56)(\tan 29.07^\circ)$

$C \approx 31.13$

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

$B\cos 29.07^\circ = 56$

$B = \dfrac{56}{\cos 29.07} \approx 64.07$

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

20. $\tan\theta = \frac{10}{14}$

$\tan\theta \approx .7143$

$\theta = \arctan .7143 \approx 35.54^\circ$

$\alpha = 90^\circ - 35.54^\circ = 54.46^\circ$

$10^2 + 14^2 = D^2$

$100 + 196 = D^2$

$296 = D^2$

$\sqrt{296} = D^2$

$D \approx 17.20$

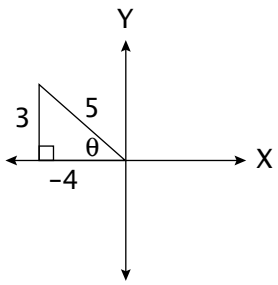
Lesson 7A

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

$\sin\theta = \frac{3}{5}$ $\quad \csc\theta = \frac{5}{3}$

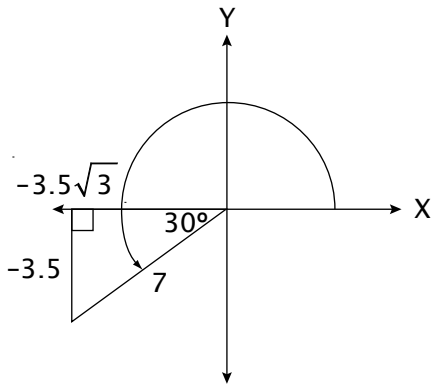
$\cos\theta = \frac{-4}{5}$ $\quad \sec\theta = \frac{5}{-4}$

$\tan\theta = \frac{3}{-4}$ $\quad \cot\theta = \frac{-4}{3}$



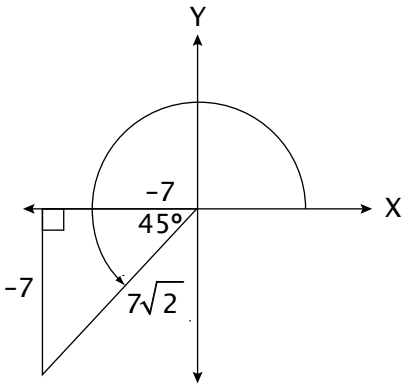
8.

hyp	θ	ref	quad	sinθ	cosθ	tanθ
7	210°	30°	III	$\frac{-1}{2}$	$\frac{-\sqrt{3}}{2}$	$\frac{\sqrt{3}}{3}$



9.

hyp	θ	ref	quad	sinθ	cosθ	tanθ
$7\sqrt{2}$	225°	45°	III	$\frac{-\sqrt{2}}{2}$	$\frac{-\sqrt{2}}{2}$	1



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

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

$Y \sin 18^\circ = 9$

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

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

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

$X \approx 27.7$