

Lesson 4D

1. $\cos 75^\circ = \frac{30}{U}$
 $U \cos 75^\circ = 30$
 $U = \frac{30}{\cos 75^\circ}$
 $U \approx \frac{30}{.2588} \approx 115.92$
2. $\sin 28^\circ = \frac{\sqrt{9}}{V}$
 $V \sin 28^\circ = \sqrt{9}$
 $V \sin 28^\circ = 3$
 $V = \frac{3}{\sin 28^\circ}$
 $V \approx \frac{3}{.4695} \approx 6.39$
3. $\tan 18^\circ = \frac{7}{W}$
 $W \tan 18^\circ = 7$
 $W = \frac{7}{\tan 18^\circ}$
 $W \approx \frac{7}{.3249} \approx 21.55$
4. $\cos 64^\circ = \frac{4.75}{X}$
 $X \cos 64^\circ = 4.75$
 $X = \frac{4.75}{\cos 64^\circ}$
 $X \approx \frac{4.75}{.4384} \approx 10.83$
5. $\sin 42^\circ = \frac{Y}{22}$
 $22 \sin 42^\circ = Y$
 $Y \approx 22(.6691) \approx 14.72$
6. $\tan 51^\circ = \frac{Z}{18}$
 $18 \tan 51^\circ = Z$
 $Z \approx 18(1.2349) \approx 22.23$

Lesson 5A

1. $\tan 28^\circ \approx .5317$
2. $\sin 33^\circ \approx .5446$
3. $\cos 40^\circ \approx .7660$
4. $\tan 5^\circ \approx .0875$
5. $\cos 72^\circ \approx .3090$

6. $\sin 69^\circ \approx .9336$
7. $\arccos .9848 \approx 10^\circ$
8. $\arctan .5317 \approx 28^\circ$
9. $\arcsin .9511 \approx 72^\circ$
10. $\arctan 4.7046 \approx 78^\circ$
11. $\arcsin .4067 \approx 24^\circ$
12. $\arccos .4067 \approx 66^\circ$
13. $25^\circ 15' 10''$
 $\frac{10''}{1} \times \frac{1'}{60''} = \left(\frac{10}{60}\right)' \approx .17'$
 $\frac{15.17'}{1} \times \frac{1^\circ}{60'} = \left(\frac{15.17}{60}\right)^\circ \approx .253^\circ$
 $25^\circ 15' 10'' \approx 25.253^\circ$
14. $74^\circ 22' 30''$
 $\frac{30''}{1} \times \frac{1'}{60''} = \left(\frac{30}{60}\right)' = .5'$
 $\frac{22.5'}{1} \times \frac{1^\circ}{60'} = \left(\frac{22.5}{60}\right)^\circ = .375^\circ$
 $74^\circ 22' 30'' \approx 74.375^\circ$
15. $32^\circ 48' 12''$
 $\frac{12''}{1} \times \frac{1'}{60''} = \left(\frac{12}{60}\right)' = .20'$
 $\frac{48.2'}{1} \times \frac{1^\circ}{60'} = \left(\frac{48.2}{60}\right)^\circ \approx .803^\circ$
 $32^\circ 48' 12'' \approx 32.803^\circ$
16. $81^\circ 50'$
 $\frac{50'}{1} \times \frac{1^\circ}{60'} = \left(\frac{50}{60}\right)^\circ \approx .833^\circ$
 $81^\circ 50' \approx 81.833^\circ$
17. $25^\circ 15' 10'' \approx 25.253^\circ$
18. $74^\circ 22' 30'' \approx 74.375^\circ$
19. $32^\circ 48' 12'' \approx 32.803^\circ$
20. $81^\circ 50' \approx 81.833^\circ$
21. $\arccos .5825 \approx 54.37^\circ$
22. $\arctan 2.4 \approx 67.38^\circ$
23. $\arcsin .9918 \approx 82.66^\circ$
24. $\arccos .9299 \approx 21.58^\circ$
25. $\arccos .5825 \approx 54^\circ 22' 24''$
26. $\arctan 2.4 \approx 67^\circ 22' 48''$
27. $\arcsin .9918 \approx 82^\circ 39' 27''$
28. $\arccos .9299 \approx 21^\circ 34' 51''$

Lesson 5B

1. $\sin 82^\circ \approx .9903$
2. $\tan 14^\circ \approx .2493$
3. $\sin 38^\circ \approx .6157$
4. $\cos 49^\circ \approx .6561$
5. $\cos 58^\circ \approx .5299$
6. $\tan 77^\circ \approx 4.3315$
7. $\arcsin .0175 \approx 1^\circ$
8. $\arccos .4848 \approx 61^\circ$
9. $\arcsin .8746 \approx 61^\circ$
10. $\arctan .4245 \approx 23^\circ$
11. $\arctan 1.1918 \approx 50^\circ$
12. $\arccos .9945 \approx 6^\circ$
13. $47^\circ 36' 25''$
 $\frac{25''}{1} \times \frac{1'}{60''} = \left(\frac{25}{60} \right)'' \approx .42'$
 $\frac{36.42'}{1} \times \frac{1^\circ}{60'} = \left(\frac{36.42}{60} \right)^\circ \approx .607^\circ$
 $47^\circ 36' 25'' \approx 47.607^\circ$
14. $53^\circ 28' 10''$
 $\frac{10''}{1} \times \frac{1'}{60''} = \left(\frac{10}{60} \right)' \approx .17'$
 $\frac{28.17'}{1} \times \frac{1^\circ}{60'} = \left(\frac{28.17}{60} \right)^\circ \approx .470^\circ$
 $53^\circ 28' 10'' \approx 53.470^\circ$
15. $8^\circ 55'$
 $\frac{55'}{1} \times \frac{1^\circ}{60'} = \left(\frac{55}{60} \right)^\circ \approx .917^\circ$
 $8^\circ 55' \approx 8.917^\circ$
16. $88^\circ 0' 40''$
 $\frac{40''}{1} \times \frac{1'}{60''} = \left(\frac{40}{60} \right)' \approx .67'$
 $\frac{.67'}{1} \times \frac{1^\circ}{60'} = \left(\frac{.67}{60} \right)^\circ \approx .011^\circ$
 $88^\circ 0' 40'' \approx 88.011^\circ$
17. $47^\circ 36' 25'' \approx 47.607^\circ$
18. $53^\circ 28' 10'' \approx 53.469^\circ$
19. $8^\circ 55' \approx 8.917^\circ$
20. $88^\circ 0' 40'' \approx 88.011^\circ$
21. $\arcsin .4700 \approx 28.03^\circ$

22. $\arccos .9722 \approx 13.54^\circ$
23. $\arctan 3.3333 \approx 73.30^\circ$
24. $\arcsin .9250 \approx 67.67^\circ$
25. $\arcsin .4700 \approx 28^\circ 2' 3''$
26. $\arccos .9722 \approx 13^\circ 32' 30''$
27. $\arctan 3.3333 \approx 73^\circ 18' 00''$
28. $\arcsin .9250 \approx 67^\circ 40' 6''$

Lesson 5C

There are several ways to solve each of these problems. One method will be shown for each.

1. $\sin 22.5^\circ = \frac{18}{B}$
 $B \sin 22.5^\circ = 18$
 $B = \frac{18}{\sin 22.5^\circ} \approx 47$
 $\tan 67.5^\circ = \frac{A}{18}$
 $A = (18)(\tan 67.5^\circ) \approx 43.5$
 $\alpha = 90^\circ - 22.5^\circ = 67.5^\circ$
2. $\sin 47.3^\circ = \frac{D}{11}$
 $D = (11)(\sin 47.3^\circ) \approx 8.1$
 $\sin 42.7^\circ = \frac{C}{11}$
 $C = 11(\sin 42.7^\circ) \approx 7.5$
 $\alpha = 90^\circ - 47.3^\circ = 42.7^\circ$
3. $\tan 35.6^\circ = \frac{F}{29}$
 $F = (29)(\tan 35.6^\circ) \approx 20.8$
 $\cos 35.6^\circ = \frac{29}{E}$
 $E \cos 35.6^\circ = 29$
 $E = \frac{29}{\cos 35.6^\circ} \approx 35.7$
 $\alpha = 90^\circ - 35.6^\circ = 54.4^\circ$

4. $50^\circ 42' 30'' \approx 50.71^\circ$
 $\sin 50.71^\circ = \frac{G}{250}$
 $G = (250)(\sin 50.71^\circ) \approx 193.5$
 $\cos 50.71^\circ = \frac{H}{250}$
 $H = (250)(\cos 50.71^\circ) \approx 158.3$
5. $\tan \theta = \frac{12}{13} \approx .9231$
 $\arctan .9231 \approx 42.71^\circ \approx 42^\circ 42' 36''$
 $\tan \alpha = \frac{13}{12} \approx 1.0833$
 $\alpha = 90^\circ - \theta = 47.29^\circ \approx 47^\circ 17' 24''$
6. $\tan \theta = \frac{34}{27} \approx 1.2593$
 $\arctan 1.2593 \approx 51.55^\circ$ or $51^\circ 32' 50''$
 $\alpha = 90^\circ - 51.55^\circ = 38.45^\circ$ or $\approx 38^\circ 27'$
7. $\sin \theta = \frac{16}{29} \approx .5517$
 $\arcsin .5517 \approx 33.49^\circ \approx 33^\circ 29' 24''$
 $\alpha = 90^\circ - 33.49^\circ = 56.51^\circ \approx 56^\circ 30' 36''$
8. $\cos \theta = \frac{76}{100} = .7600$
 $\arccos .7600 \approx 40.54^\circ \approx 40^\circ 32' 9''$
 $\alpha = 90^\circ - 40.54^\circ = 49.46^\circ \approx 49^\circ 27' 36''$

Lesson 5D

1. $\sin 39.1^\circ = \frac{B}{6}$
 $B = (6)(\sin 39.1^\circ) \approx 3.8$
 $\cos 39.1^\circ = \frac{A}{6}$
 $A = (6)(\cos 39.1^\circ) \approx 4.7$
 $\alpha = 90^\circ - 39.1^\circ = 50.9^\circ$
2. $\cos 42.25^\circ = \frac{20}{D}$
 $D = \frac{20}{\cos 42.25^\circ} \approx 27.0$
 $\sin 42.25^\circ = \frac{C}{27.0}$
 $C = (27)(\sin 42.25^\circ) \approx 18.2$
 $\theta = 42^\circ 15' = 42.25^\circ$
 $\alpha = 90^\circ - 42.25^\circ = 47.75^\circ$

3. $\tan 28^\circ = \frac{E}{57}$
 $E = (57)(\tan 28^\circ) \approx 30.3$
 $\sin 62^\circ = \frac{57}{F}$
 $F = \frac{57}{\sin 62^\circ} \approx 64.6$
 $\alpha = 90^\circ - 62^\circ = 28^\circ$
4. $90^\circ - 25.73^\circ = 64.27^\circ$
 $\cos 64.27^\circ = \frac{18.3}{H}$
 $H \cos 64.27^\circ = 18.3$
 $H = \frac{18.3}{\cos 64.27^\circ} \approx 42.2$
 $\sin 64.27^\circ = \frac{G}{42.2}$
 $G = (42.2)(\sin 64.27^\circ) \approx 38.0^\circ$
 $\theta = 25^\circ 44' \approx 25.73^\circ$
 $\alpha = 90^\circ - 25.73^\circ = 64.27^\circ$
5. $\tan \theta = \frac{6.2}{5.4} \approx 1.1481$
 $\arctan 1.1481 \approx 48.95^\circ$
 $\theta \approx 48.95^\circ \approx 48^\circ 56' 38''$
 $\alpha = 90^\circ - 48.95^\circ = 41.05^\circ \approx 41^\circ 3'$
6. $\tan \theta = \frac{40.5}{28.7} \approx 1.4111$
 $\arctan 1.4111 \approx 54.68^\circ$
 $\theta \approx 54.68^\circ \approx 54^\circ 40' 34''$
 $\alpha = 90^\circ - 54.68^\circ = 35.32^\circ \approx 35^\circ 19' 12''$
7. $\cos \theta = \frac{39}{63} \approx .6190$
 $\arccos .6190 \approx 51.76^\circ \approx 51^\circ 45' 25''$
 $\alpha = 90^\circ - 51.76^\circ = 38.24^\circ \approx 38^\circ 14' 24''$
8. $\sin \theta = \frac{3.8}{7.9} \approx .4810$
 $\arcsin .4810 \approx 28.75^\circ$
 $\theta \approx 28.75^\circ \approx 28^\circ 45' 03''$
 $\alpha = 90^\circ - 28.75^\circ = 61.25^\circ \approx 61^\circ 15'$