

305 : 53-66, 77

53. $\sin^{-1}(-1) = \boxed{-\frac{\pi}{2}}$

54. $\cos^{-1}\left(\frac{\sqrt{3}}{2}\right) = \boxed{\frac{\pi}{6}}$

55. $\tan^{-1}\left(-\frac{\sqrt{3}}{3}\right) = \boxed{-\frac{\pi}{6}}$

56. $\arccos 0 = \boxed{\frac{\pi}{2}}$

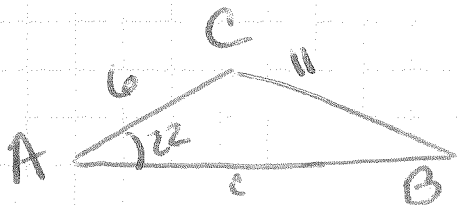
57. $\arctan(-1) = \boxed{-\frac{\pi}{4}}$

58. $\arccos \frac{\sqrt{2}}{2} = \boxed{\frac{\pi}{4}}$

59. $\sin^{-1}\left[\sin\left(-\frac{\pi}{3}\right)\right] = \boxed{-\frac{\pi}{3}}$

60. $\cos^{-1}[\cos(-3\pi)]$
 $-3\pi + 2\pi = -\pi + 2\pi = \pi$
 $\cos^{-1}[\cos(-3\pi)] = \boxed{\pi}$

61. $a=11$ $b=6$ $A=22^\circ$



$11 > 6$
 1Δ

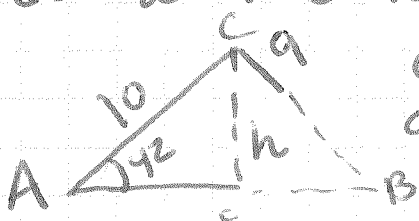
$\frac{\sin B}{6} = \frac{\sin 22}{11}$

$B = \sin^{-1}\left(\frac{6 \sin 22}{11}\right) = \boxed{11.790^\circ}$

$C = 180 - (22 + 11.790^\circ)$

$c = \frac{11 \sin 146.209^\circ}{\sin 22} = \boxed{16.331}$

62. $a=9$ $b=10$ $A=42^\circ$

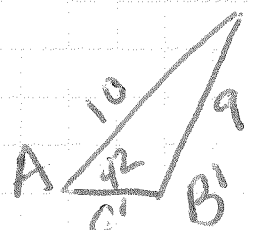


$9 < 10$
 $9 > h$
 2Δ

$h = 10 \sin 42^\circ = 6.691$

$B = \sin^{-1}\left(\frac{10 \sin 42}{9}\right) = 48.029^\circ$

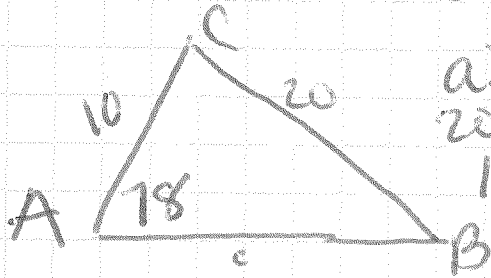
$C = 89.971^\circ$



$B' = 180 - 48.029 = 131.971^\circ$
 $C' = 180 - 131.971 + 42 = 6.029^\circ$
 $c' = 1.413$

$c' = \frac{9 \sin 6.029}{\sin 42}$

63. $a=20$ $b=10$ $A=78^\circ$



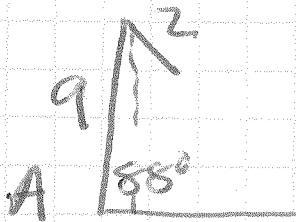
$a > b$
 $20 > 10$
 1Δ

$$B = \sin^{-1}\left(\frac{10 \sin 78}{20}\right) = 29.280^\circ$$

$$C = 180 - 107.28 = 72.72^\circ$$

$$c = \frac{20 \sin 72.72}{\sin 78} = 19.524$$

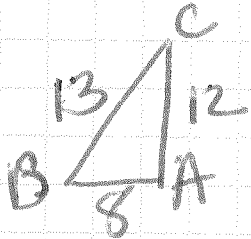
64. $a=2$ $b=9$ $A=88^\circ$



$2 < 9$ ~~$z < h$~~ 0Δ

$$h = 9 \sin 88 = 8.995$$

65. $a=13$ $b=12$ $c=8$



$$13^2 = 12^2 + 8^2 - 2(12)(8)(\cos A)$$

$$-39 = -192 \cos A \quad A = \cos^{-1}\left(\frac{39}{192}\right) = 78.280^\circ$$

$$\frac{\sin C}{8} = \frac{\sin 78.280^\circ}{13}$$

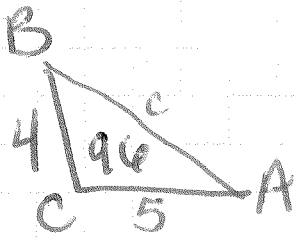
$$C = \sin^{-1}\left(\frac{8 \sin 78.280^\circ}{13}\right)$$

$$B = 180 - 115.333$$

$$C = 37.053$$

$$B = 64.667$$

66. $a=4$ $b=5$ $C=96^\circ$



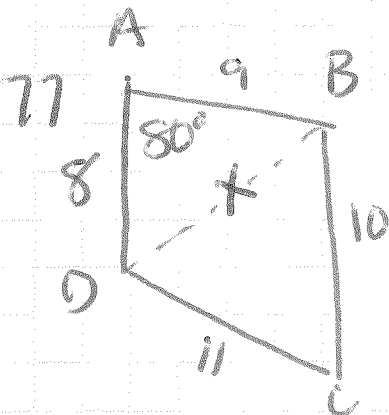
$$c^2 = 4^2 + 5^2 - 2(4)(5)\cos 96$$

$$c^2 = 45.181 \quad \underline{c = 6.722}$$

$$\frac{\sin A}{4} = \frac{\sin 96}{6.722} \quad A = \sin^{-1}\left(\frac{4\sin 96}{6.722}\right)$$

$$B = 180 - 132.287 = 47.713^\circ$$

$$A = 36.287^\circ$$



$$x^2 = 9^2 + 8^2 - 2(8)(9)\cos 80^\circ$$

$$x^2 = 119.995 \quad \underline{x = 10.954}$$

$$x^2 = 11^2 + 10^2 - 2(10)(11)\cos C$$

$$\frac{-101.005}{-220} = \cos C$$

$$C = \cos^{-1}\left(\frac{101.005}{220}\right) = \boxed{62.670^\circ}$$

b. Area $\triangle DAB$

$$= \frac{1}{2}(8)(9)\sin 80^\circ = 35.45$$

Area $\triangle DBC$

$$\frac{1}{2}(11)(10)\sin 62.67 = 48.861$$

$$\boxed{A = 84.314 \text{ u}^2}$$