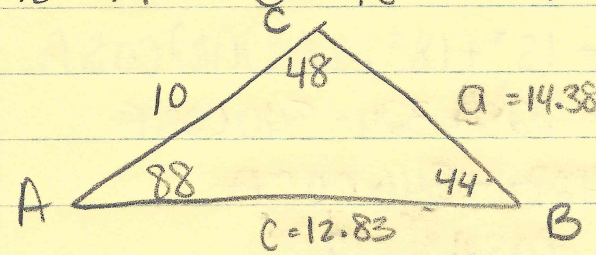
10.2 HW #634 #5, 7, 9-15 odd, 17-25 odd, 41, 46, 47

5. $B = 44°$ $C = 48°$ $b = 12$



$\frac{\sin 44}{12} = \frac{\sin 48}{x}$

$x \sin 44 = 12 \sin 48$

$x = 12.83$

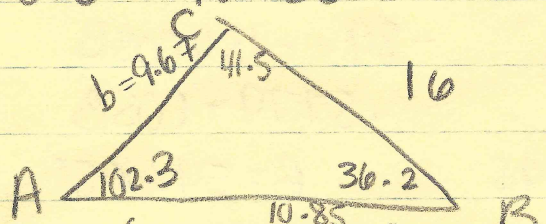
$180 - (48 + 44) = 180 - 92 = \boxed{88}$

$\frac{\sin 88}{a} = \frac{\sin 44}{12}$

$12 \sin 88 = a \sin 44$

$\boxed{a = 17.26}$

7. $A = 102.3°$ $B = 36.2$ $a = 16$



$\frac{\sin 102.3}{16} = \frac{\sin 36.2}{b}$

$b \sin 102.3 = 16 \sin 36.2$

$\boxed{b = 9.67}$

$180 - (102.3 + 36.2)$

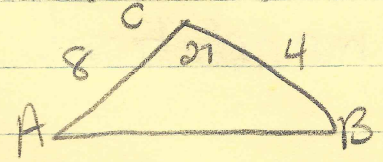
$180 - 138.5 = 41.5$

$\frac{\sin 41.5}{c} = \frac{\sin 102.3}{16}$

$16 \sin 41.5 = c \sin 102.3$

$\boxed{c = 10.85}$

9. $a = 4$ $b = 8$ $C = 27°$

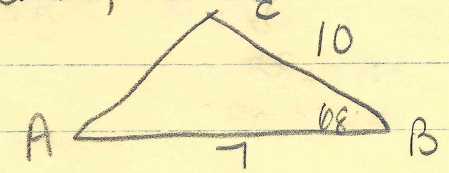


$A = \frac{1}{2} ab \sin C$

$A = \frac{1}{2}(4)(8) \sin 27$

$A = 16 \sin 27 = 7.26 \text{ units}^2$

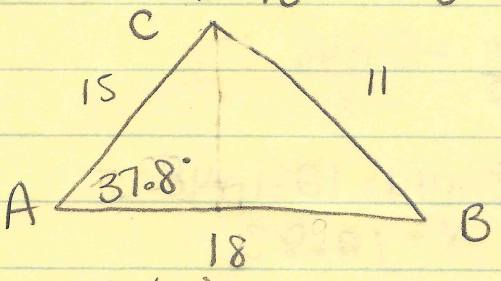
11. $c = 7$, $a = 10$, $B = 68°$



$A = \frac{1}{2}(10)(7) \sin 68$

$A = 32.45 \text{ units}^2$

13. $a=11$ $b=15$ $C=18$



$11^2 = 15^2 + 18^2 - 2(15)(18)\cos A$

$121 = 225 + 324 - 540\cos A$

$-428 = -540\cos A$

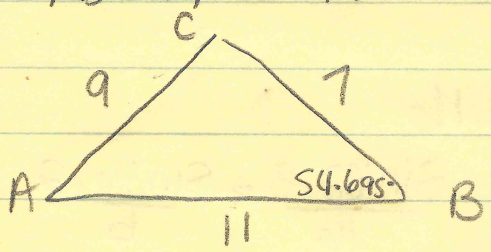
$\cos A = .79$

$A = 37.8°$

$A = \frac{1}{2}(15)(18)\sin 37.8°$

$A = 82.74$ units^2

15. $a=7$, $b=9$, $C=11$



$9^2 = 7^2 + 11^2 - 2(7)(11)\cos B$

$81 = 49 + 121 - 154\cos B$

$-89 = -154\cos B$

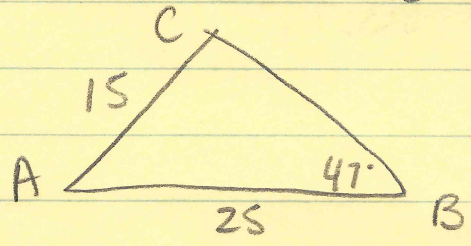
$.5779 = \cos B$

$B = 54.695°$

$A = \frac{1}{2}(7)(11)\sin 54.695$

$A = 31.4$ units^2

17. $b=15$ $c=25$ $B=47°$



$\frac{\sin 47}{15} = \frac{\sin C}{25}$

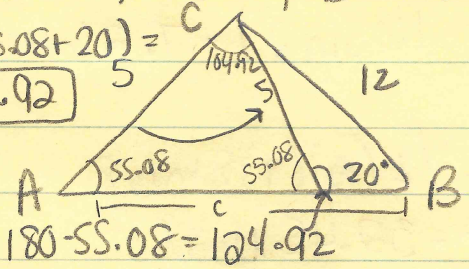
$25\sin 47 = 15\sin C$

$1.21 = \sin C$

C = no solution!

19. $a=12$, $b=5$, $B=20°$

$180-(55.08+20) = 104.92$



$180 - 55.08 = 124.92$

$\frac{\sin 20}{5} = \frac{\sin A}{12}$

$12\sin 20 = 5\sin A$

$\sin A = .82$

$A = 55.08°$

$\frac{\sin 55.08}{12} = \frac{\sin 104.92}{c}$

$c\sin 55.08 = 12\sin 104.92$

$c = 14.14$

$124.92 + 20 = 144.92$

$180 - 144.92 = \boxed{35.08}$

$$\frac{\sin 35.08}{C} = \frac{\sin 20}{5}$$

$5\sin 35.08 = C\sin 20$

$C = \boxed{8.40}$

21. $a = 5 \quad c = 12 \quad A = 102°$

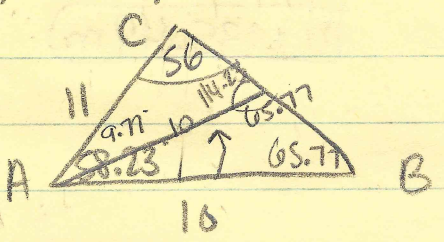
$$\frac{\sin 102}{5} = \frac{\sin C}{12}$$

$12\sin 102 = 5\sin C$

$\sin C = 2.35$

$C =$ no solution!

23. $b = 11, c = 10, C = 56°$



$$\frac{\sin 56}{10} = \frac{\sin B}{11}$$

$11\sin 56 = 10\sin B$

$\sin B = .9119$

$B = 65.77°$

$180 - 65.77 = 114.23$

$180 - (56 + 65.77)$

$180 - 121.77 = \boxed{58.23°}$

$$A_1: \frac{\sin 58.23}{A} = \frac{\sin 56}{10}$$

$10\sin 58.23 = A\sin 56$

$A = 10.25$

Case 2: $B = 114.23$ $\quad 180 - (56 + 114.23) = 180 - 170.23 = \boxed{9.77°}$

$$\frac{\sin 9.77°}{C} = \frac{\sin 56}{10}$$

$10\sin 9.77 = C\sin 56$

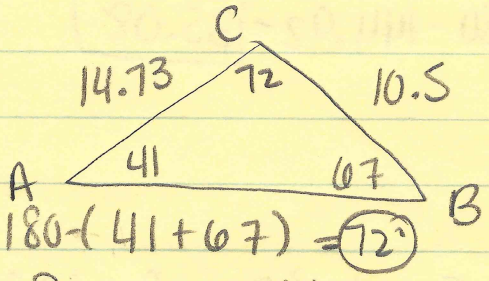
$C = \boxed{2.0469}$

25. $A = 41°$ $B = 67°$ $a = 10.5$

$$\frac{\sin 41}{10.5} = \frac{\sin 67}{B}$$

$B \sin 41 = 10.5 \sin 67$

$\boxed{B = 14.73}$

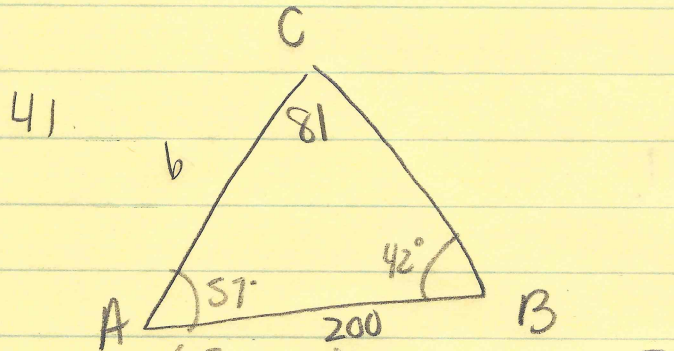


$180 - (41 + 67) = \boxed{72°}$

$$\frac{\sin 72}{C} = \frac{\sin 41}{10.5}$$

$10.5 \sin 72 = C \sin 41$

$\boxed{C = 15.22}$



$180 - (57 + 42) = 180 - 99 = \boxed{81}$

$$\frac{\sin 81}{200} = \frac{\sin 42}{b}$$

$b \sin 81 = 200 \sin 42$

$\boxed{b = 135.49\text{m}}$