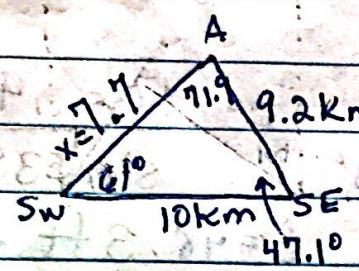
Law of Sines and Cosines Applications 1 WS

1.



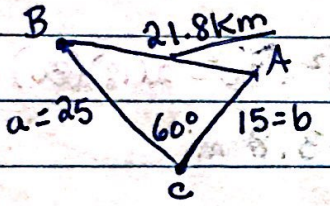
$\frac{10}{\sin A} = \frac{9.2}{\sin 61°}$

$\sin A = \frac{10 \sin 61°}{9.2}$ $\boxed{A = 71.9}$

$9.2 - 7.7 = 1.5$ $\frac{x}{\sin 47.1} = \frac{9.2}{\sin 61°}$ $x = \frac{9.2 \sin 47.1}{\sin 61°}$

SW station is closer by 1.5 km.

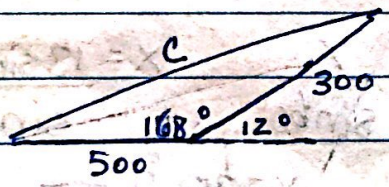
2.



$c^2 = 25^2 + 15^2 - 2(25)(15)\cos 60°$

$c^2 = 475 \rightarrow c = 21.8 \text{ km}$

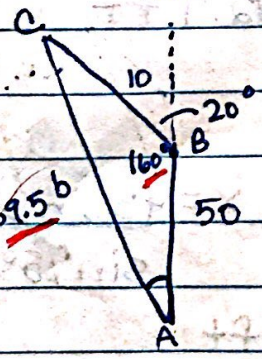
3.



$c^2 = 500^2 + 300^2 - 2(500)(300)\cos 168°$

$c = 795.9 \text{ mi}$

4.



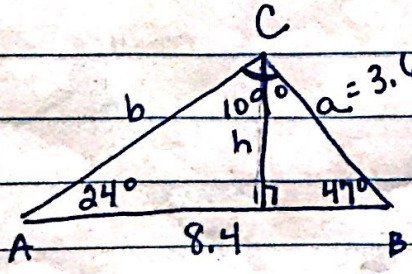
$b^2 = 50^2 + 10^2 - 2(50)(10)\cos 160°$

$b = 59.5$

$10^2 = 50^2 + 59.5^2 - 2(50)(59.5)\cos A$

$\frac{-5940.25}{-5950} = \frac{-5950\cos A}{-5950}$ $A = 3.3°$

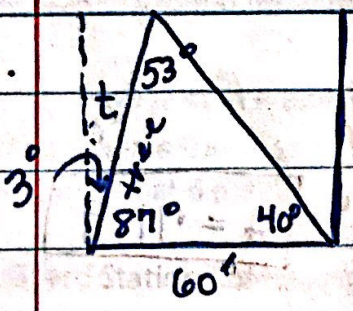
5.



$\frac{8.4}{\sin 109°} = \frac{a}{\sin 24°}$

$a = \frac{8.4 \sin 24°}{\sin 109°}$

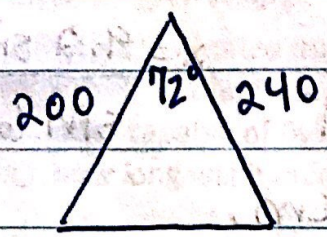
$\sin 47 = \frac{h}{3.6}$ $h = 3.6 \sin 47°$ $\boxed{h = 2.6 \text{ mi}}$

6. 

ASA

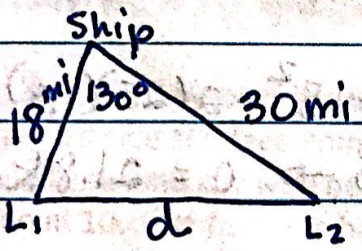
$\frac{t}{\sin 40^\circ} = \frac{60}{\sin 53^\circ}$ $t = \frac{60 \sin 40^\circ}{\sin 53^\circ}$

$t = 48.3$ ft

7. 

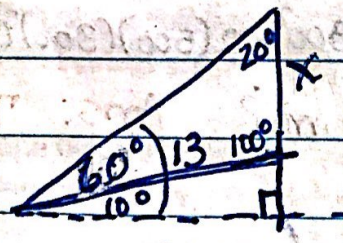
$\text{Area} = \frac{1}{2}(200)(240)\sin 72^\circ$

$= 22825.4 \text{ ft}^2$

8. 

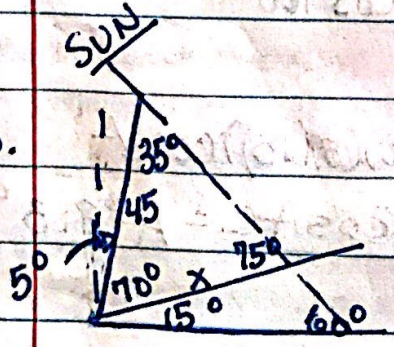
$d^2 = 18^2 + 30^2 - 2(18)(30)\cos 130^\circ$

$d = 43.8$ mi

9. 

$\frac{13}{\sin 20^\circ} = \frac{x}{\sin 60^\circ}$ $x = \frac{13 \sin 60^\circ}{\sin 20^\circ}$

$x = 32.9$ ft

10. 

$\frac{45}{\sin 75^\circ} = \frac{x}{\sin 35^\circ}$ $x = \frac{45 \sin 35^\circ}{\sin 75^\circ}$

$x = 26.7$ ft