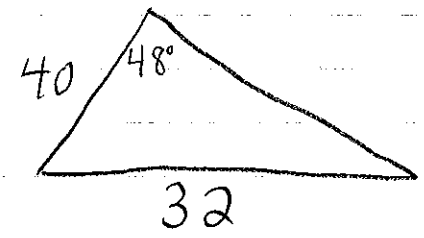
Law of Sines/Cosines Review

1) 

SSA → Law of Sines

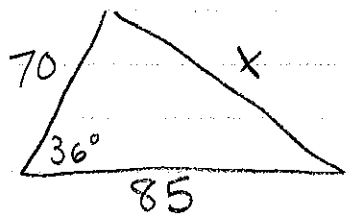
$$\frac{32}{\sin 48} = \frac{40}{\sin B}$$

$B = 68.26^\circ$ or $B = 111.7^\circ$

$C = 63.7^\circ$ $\quad C = 20.3^\circ$

c(3rd side) $= 38.6$mm $\quad c = 14.94$mm

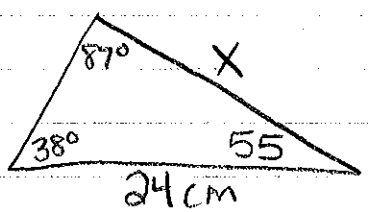
2 possible answers
38.6mm or
14.94mm

2) 

SAS - Law of Cosines

$x^2 = 70^2 + 85^2 - 2(70)(85)\cos 36$

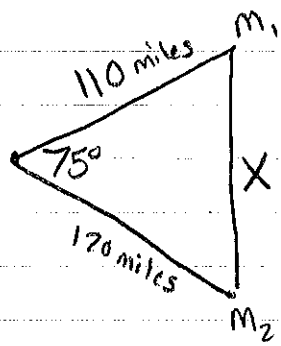
$x = 49.98$ feet

3) 

AAS - Law of Sines

$$\frac{x}{\sin 38} = \frac{24}{\sin 87}$$

$x = 14.8$ cm

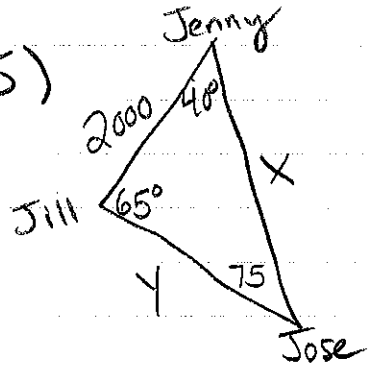
4) 

SAS - Law of Cosines

$x^2 = 110^2 + 120^2 - 2(110)(120)\cos 75$

$x = 140.2$ miles

5)



ASA - Law of Sines

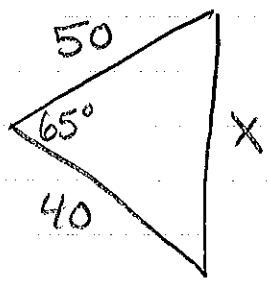
$$\frac{2000}{\sin 75} = \frac{x}{\sin 65} = \frac{y}{\sin 40}$$

$X = 1876.56$

$Y = 1330.93$

Jenny is 545.63 ~~ft farther~~ away

6)

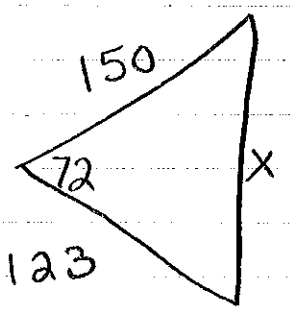


SAS Law of Cosines

$X^2 = 50^2 + 40^2 - 2(50)(40)\cos 65$

$X = 49.08$ miles

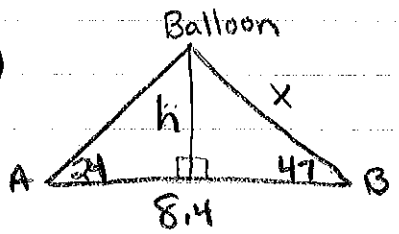
7)



$X^2 = 150^2 + 123^2 - 2(150)(123)\cos 72$

$X = 161.94$

8)



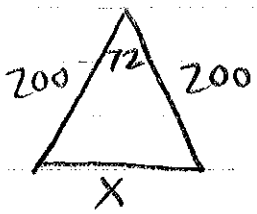
$180 - 24 - 47 = 109°$

$$\frac{x}{\sin 24} = \frac{8.4}{\sin 109} \qquad x = 3.6$$

$$\sin 47 = \frac{h}{3.6}$$

$h = 2.64$ miles

9)



SAS - Law of Cosines

$X^2 = 200^2 + 200^2 - 2(200)(200)\cos 72$

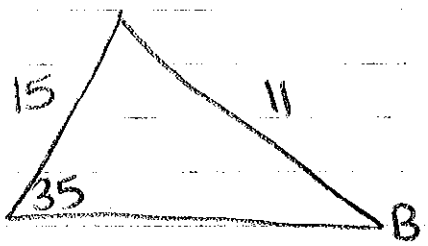
$X = 235.1$ feet

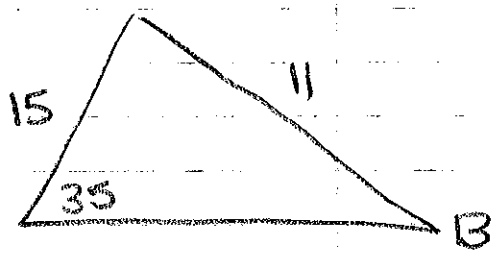
10) Angle - Side - Side or Side - Side - Angle

11) $\frac{7}{\sin 30} = \frac{16}{\sin C}$ $\quad \sin C = \frac{8}{7}$

$\sin\theta$ must be between -1 and 1. $8/7$ is outside of this range

12)





$\frac{11}{\sin 35} = \frac{15}{\sin B}$ $\quad \sin B = .782$

Sine is positive in quadrants 1 and 2,

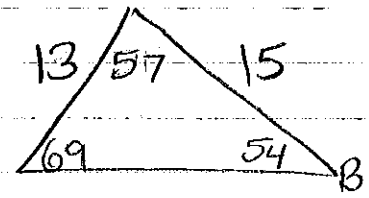
So $B = 51.45°$ or $B = 128.54°$

$C = 93.55$ $\quad C = 16.45°$

$c = 19.44$ $\quad c = 5.4$

13)

12) Area



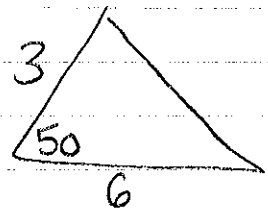
$\frac{15}{\sin 69} = \frac{13}{\sin B}$

$B = 54°$

SAS Area $= \frac{1}{2} bc \sin A$

$= \frac{1}{2}(13)(15)\sin 57 = \boxed{42.52}$

13)



SAS $A = \frac{1}{2}(3)(6)\sin 50$

$\boxed{A = 6.89}$

14) $s = \frac{10+18+22}{2} = 25$ Heron's → SSS

Area $= \sqrt{25(15)(7)(3)}$

$= \boxed{88.74}$