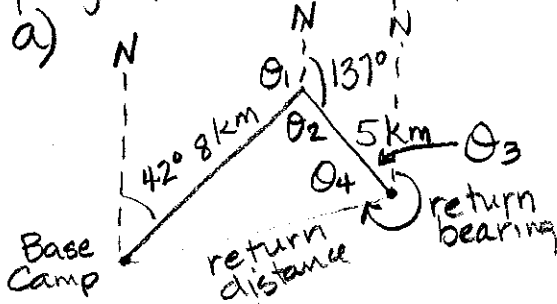


# Pre-Calculus Math II

14. page 121 # 14, 15, 19, 20



Note: compass bearings are measured clockwise from north

b) The north lines are all parallel so:

$$42^\circ + \theta_1 = 180^\circ$$

$$\theta_1 = 138^\circ$$

$$\text{So... } \theta_2 + 138^\circ + 137^\circ = 360^\circ$$

$$\theta_2 = 85^\circ$$

Return distance is...

$$r^2 = 8^2 + 5^2 - 2(8)(5)\cos 85^\circ$$

$$r^2 = 64 + 25 - 6.972459$$

$$r^2 = 82.027541$$

$$r = 9.0569$$

$$\text{return distance} = 9.1 \text{ km}$$

$$\text{c) } \theta_3 + 137^\circ = 180^\circ$$

$$\theta_3 = 43^\circ$$

$$\frac{\sin \theta_2}{\text{return distance}} = \frac{\sin \theta_4}{8}$$

$$\frac{\sin 85^\circ}{9.0569} = \frac{\sin \theta_4}{8}$$

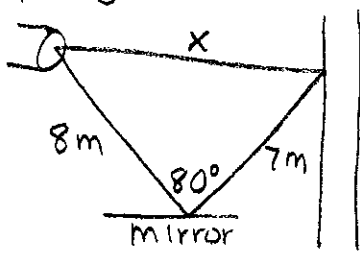
$$0.8799432 = \sin \theta_4$$

$$\theta_4 = 61.6^\circ$$

$$\begin{aligned} \text{return bearing} &= 360^\circ - 43^\circ - 61.6^\circ \\ &= 255.4^\circ \end{aligned}$$

page 121 cont.

15.



$$x^2 = 8^2 + 7^2 - 2(8)(7) \cos 80^\circ$$

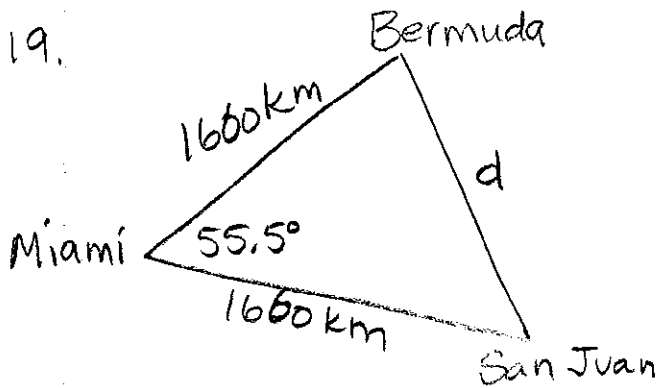
$$x^2 = 64 + 49 - 19.448596$$

$$x^2 = 93.551404$$

$$x = 9.67$$

9.7 m.

19.



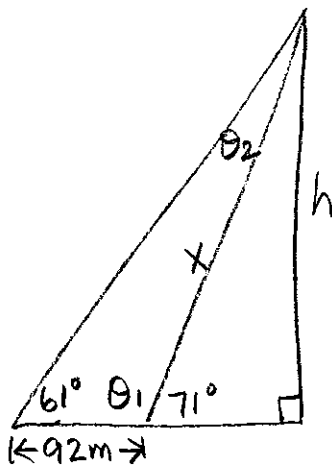
$$d^2 = 1660^2 + 1660^2 - 2(1660)(1660) \cos 55.5^\circ$$

$$d^2 = 2389621.947$$

$$d = 1545.840$$

d = 1546 km

20.



$$\theta_1 = 180^\circ - 71^\circ$$

$$\theta_1 = 109^\circ$$

$$\theta_2 = 180^\circ - 61^\circ - 109^\circ$$

$$\theta_2 = 10^\circ$$

$$\frac{x}{\sin 61^\circ} = \frac{92}{\sin 10^\circ}$$

$$x = \frac{92 \sin 61^\circ}{\sin 10^\circ}$$

$$x = \frac{92 (0.87462)}{0.173648}$$

$$x = 463.38017$$

$$\sin 71^\circ = \frac{h}{463.38017}$$

$$0.9455186 = \frac{h}{463.38017}$$

$$438.13 = h$$

$$438.1 \text{ m} = h$$