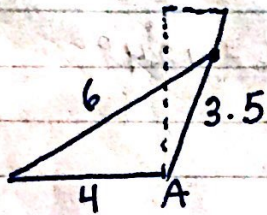


Law of Sines & Cosines Applications 2

✓ 1.



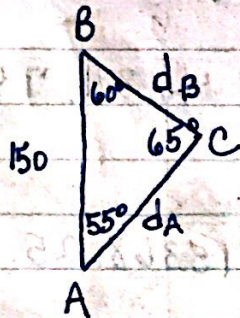
$$6^2 = 3.5^2 + 4^2 - 2(3.5)(4)\cos A$$

$$7.75 = -28\cos A$$

$$\cos A = \frac{-7.75}{28} \quad A = 106.67^\circ - 90^\circ$$

$$\boxed{16.07^\circ}$$

2.



$$\frac{150}{\sin 65^\circ} = \frac{a}{\sin 55^\circ} \quad \frac{150}{\sin 65^\circ} = \frac{b}{\sin 60^\circ}$$

$$a = \frac{150 \sin 55^\circ}{\sin 65^\circ}$$

$$b = \frac{150 \sin 60^\circ}{\sin 65^\circ}$$

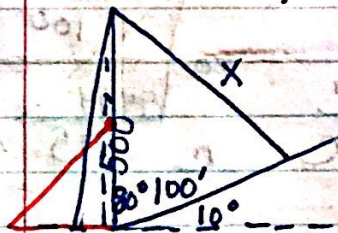
$$\boxed{d_B = 135.58 \text{ mi}}$$

$$\boxed{d_A = 143.33 \text{ mi}}$$

3b) →

$$\frac{135.58 (60 \text{ mins})}{200} \approx 40.7 \text{ or } 41 \text{ mins}$$

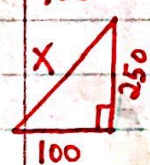
4.



$$(A) \quad x^2 = 500^2 + 100^2 - 2(500)(100)\cos 80^\circ$$

$$x = 492.58 \text{ ft}$$

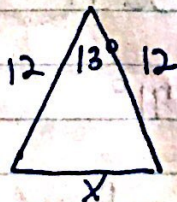
(B)



$$x^2 = 100^2 + 250^2$$

$$x = 269.26 \text{ ft}$$

5.

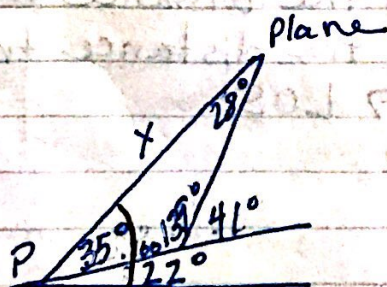


$$x^2 = 12^2 + 12^2 - 2(12)(12)\cos 13^\circ$$

$$x^2 = 288 - 288\cos 13^\circ$$

$$\boxed{x = 2.72 \text{ ft}}$$

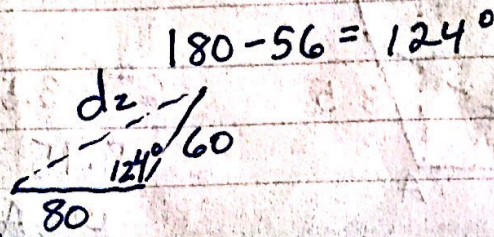
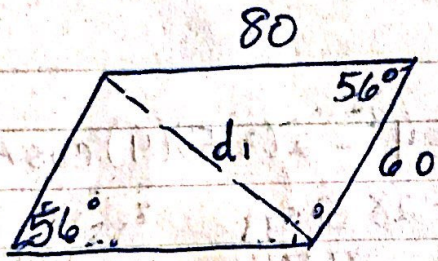
7.



$$\frac{100}{\sin 6^\circ} = \frac{x}{\sin 139^\circ}$$

$$x = \frac{100 \sin 139^\circ}{\sin 6^\circ} = 627.64 \text{ ft}$$

8.



$$K = 2 \left[\frac{1}{2} (60)(80) \sin 56^\circ \right] = 397.94 \text{ sq ft}$$

$$d_1^2 = 60^2 + 80^2 - 2(80)(60) \cos 56^\circ = 4631.74 \dots$$

$$d_1 = 68.05 \text{ ft}$$

$$d_2^2 = 60^2 + 80^2 - 2(60)(80) \cos 124^\circ = 15368.25 \dots$$

$$d_2 = 123.97 \text{ ft}$$

9. sides = $60^a, 75^b, 100^c$

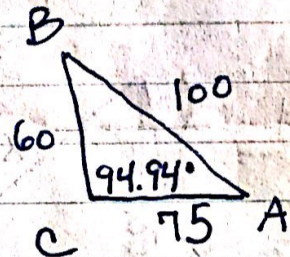
$$100^2 = 60^2 + 75^2 - 2(60)(75) \cos C$$

$$100^2 - 60^2 - 75^2 = -2(60)(75) \cos C$$

$$775 = -9000 \cos C$$

$$-0.861 = \cos C$$

$$C = 94.94^\circ$$



$$\frac{60}{\sin A} = \frac{100}{\sin 94.94^\circ}$$

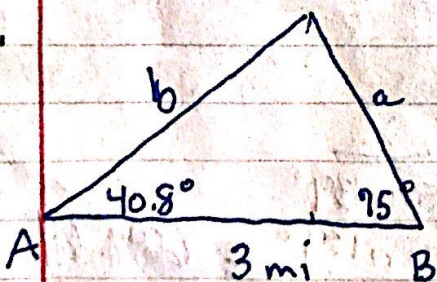
$$\frac{60 \sin 94.94^\circ}{100} = \sin A$$

$$A = 36.71^\circ$$

$$B = 180^\circ - (94.94^\circ + 36.71^\circ) = 48.35^\circ$$

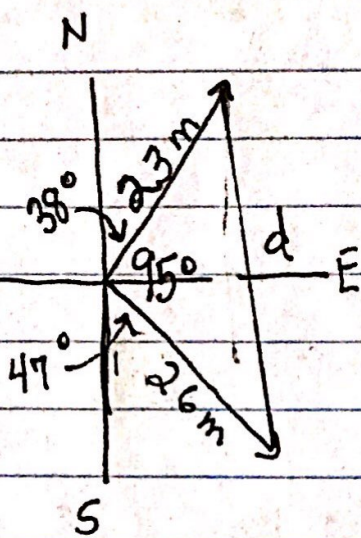
Angle measures: $94.94^\circ, 48.35^\circ, 36.71^\circ$

10.



* a is the distance from town B
b is the distance from town A
ASA \rightarrow LOS

Applications #2

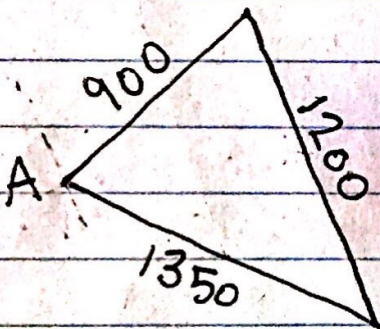


2 hrs

$$d^2 = 23^2 + 26^2 - 2(23)(26) \cos 95^\circ$$

$$d^2 = 1309, 238, 268$$

$$d = \sqrt{\text{ANS}} = \boxed{36.18 \text{ or } 36.2 \text{ miles}}$$



$$1200^2 = 900^2 + 1350^2 - 2(900)(1350) \cos A$$
$$\frac{(1200^2 - 900^2 - 1350^2)}{(-2 \cdot 900 \cdot 1350)} = \frac{-2(900)(1350) \cos A}{-2(900)(1350)}$$

$$0.49074 \dots = \cos A$$

$$A = \cos^{-1}(\text{ANS})$$

$$\boxed{A \approx 60.61^\circ \text{ or } 60.6^\circ}$$