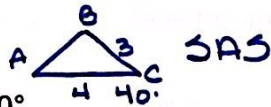


Name: _____

Solve each triangles:



1.) $a = 3, b = 4, C = 40^\circ$

$$c^2 = 3^2 + 4^2 - 2(3)(4)\cos 40^\circ$$

$$c = 2.57$$

$$3^2 = 2.57^2 + 4^2 - 2(2.57)(4)\cos A$$

$$\angle A = 48.6^\circ$$

$$\angle B = 91.4^\circ$$



3.) $a = 3, c = 2, B = 110^\circ$

$$b^2 = 3^2 + 2^2 - 2(3)(2)\cos 110^\circ$$

$$b = 4.14$$

$$3^2 = 2^2 + 4.14^2 - 2(2)(4.14)\cos A$$

$$\angle A = 43^\circ$$

$$\angle C = 27^\circ$$

5.) $a = 12, b = 13, c = 5$ S.S.S

$$5^2 = 12^2 + 13^2 - 2(12)(13)\cos C$$

$$\angle C = 22.6^\circ$$

$$13^2 = 12^2 + 5^2 - 2(12)(5)\cos B$$

$$\angle B = 90^\circ$$

$$\angle A = 67.4^\circ$$

7.) $a = 5, b = 8, c = 9$ SSS

$$5^2 = 8^2 + 9^2 - 2(8)(9)\cos A$$

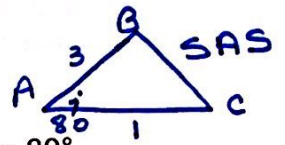
$$\angle A = 33.6^\circ$$

$$8^2 = 5^2 + 9^2 - 2(5)(9)\cos B$$

$$\angle B = 62.2^\circ$$

$$\angle C = 84.3^\circ$$

Law of Cos



2.) $b = 1, c = 3, A = 80^\circ$

$$a^2 = 1^2 + 3^2 - 2(1)(3)\cos 80^\circ$$

$$a = 2.99$$

$$1^2 = 3^2 + 2.99^2 - 2(3)(2.99)\cos B$$

$$\angle B \approx 19.2^\circ$$

$$\angle C = 80.8^\circ$$

4.) $a = 2, b = 2, C = 50^\circ$

$$c^2 = 2^2 + 2^2 - 2(2)(2)\cos 50^\circ$$

$$c = 1.69$$

$$2^2 = 2^2 + 1.69^2 - 2(2)(1.69)\cos B$$

$$\angle B = 65^\circ$$

$$\angle A = 65^\circ$$

6.) $a = 2, b = 2, c = 2$ SSS

$$3 = \text{sides} \quad 3 = \angle's$$

$$\angle A = 60^\circ$$

$$\angle B = 60^\circ$$

$$\angle C = 60^\circ$$

8.) $a = 10, b = 8, c = 5$ SSS

$$10^2 = 8^2 + 5^2 - 2(8)(5)\cos A$$

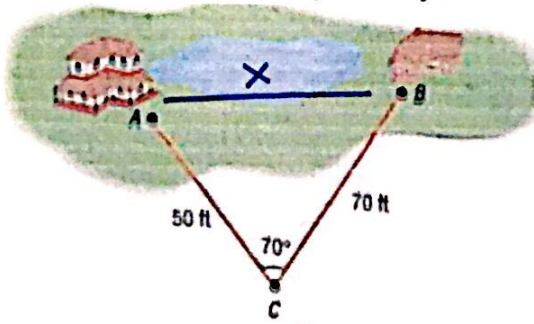
$$\angle A = 97.9^\circ$$

$$8^2 = 10^2 + 5^2 - 2(10)(5)\cos B$$

$$\angle B = 52.4^\circ$$

$$\angle C = 29.7^\circ$$

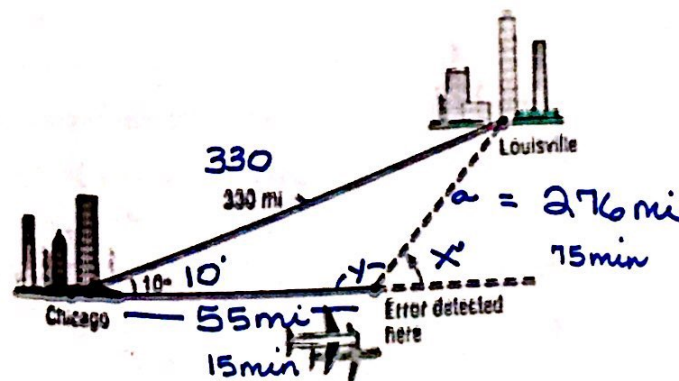
- 9.) Consult the figure. To find the distance from house A to the house at B, a surveyor measures the angle ABC, which is found to be 70° and then walks off the distance to each house, 50 feet and 70 feet, respectively. How far apart are the houses?



$$x^2 = 50^2 + 70^2 - 2(50)(70)\cos 70^\circ$$

$$x = 70.75 \text{ ft apart}$$

- 10.) **Revising a Flight Plan** In attempting to fly from Chicago to Louisville, a distance of 330 miles, a pilot inadvertently took a course that was 10° in error, as indicated in the figure.
- (a) If the aircraft maintains an average speed of 220 miles per hour and if the error in direction is discovered after 15 minutes, through what angle should the pilot turn to head toward Louisville?
- (b) What new average speed should the pilot maintain so that the total time of the trip is 90 minutes?



a.) $a^2 = 330^2 + 55^2 - 2(330)(55)\cos 10^\circ$
 $a = 276.0 \text{ mi}$

$$330^2 = 55^2 + 276^2 - 2(55)(276)\cos Y$$

$$\angle Y = 168.02^\circ$$

$$\angle X = 11.98^\circ \approx 12^\circ$$

b.) $276 / 75 = 3.68 \text{ miles per min}$
 $\times 60 / 220.8 \text{ mph}$

Speed 220 mph

$$\frac{220 \text{ mi}}{\text{hr}} \frac{1 \text{ hr}}{60 \text{ min}}$$

$$3.67 \text{ miles per min}$$

$$\times 15$$

$$55 \text{ miles}$$