Adv. Alg.-Trig.

HW 9.6

#1-3 leave as fractions

Quiz Monday (LOS and LOC)

Homework #9.5

1) 8 2) 18 3) 7

4) 7 5) 21 6) 14

Practice Worksheet

8) $b = 34.6$

Law of Cosines

Given SIDE, SIDE, SIDE

$$a^2 = b^2 + c^2 - 2bc\cos A$$

Let us solve for Cos A:

$$a^2 = b^2 + c^2 - 2bc\cos A$$

$$-b^2 - c^2 \qquad -b^2 - c^2$$

$$\frac{a^2 - b^2 - c^2}{-2bc} = \frac{-2bc\cos A}{-2bc}$$

$$(-1)\frac{-a^2 + b^2 + c^2}{+2bc} = \cos A$$

$$\frac{b^2 + c^2 - a^2}{2bc} = \cos A$$

$$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$$

Therefore:

$\cos A = \frac{b^2+c^2-a^2}{2bc}$

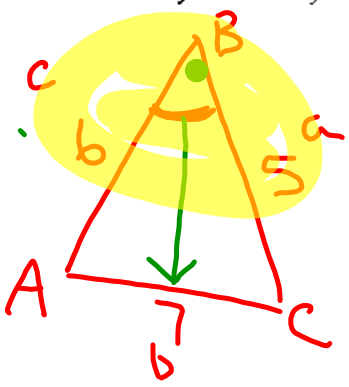
$\cos B = \frac{a^2+c^2-b^2}{2ac}$

$\cos C = \frac{a^2+b^2-c^2}{2ab}$

} law of cosines (S,S,S)

Examples:

1) $\Delta ABC, \quad a = 5, \quad b = 7, \quad c = 6, \quad Find\ CosB.$

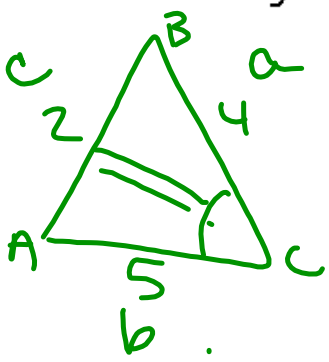


$$\cos B = \frac{a^2+c^2-b^2}{2ac}$$

$$\cos B = \frac{5^2+6^2-7^2}{2(5)(6)}$$

$$\cos B = .2$$

2) In ΔABC, the sides are 2, 4, 5. Find to the nearest degree, the smallest angle of the triangle.



smallest $\angle$ across from shortest side.

$$\cos C = \frac{a^2+b^2-c^2}{2ab}$$

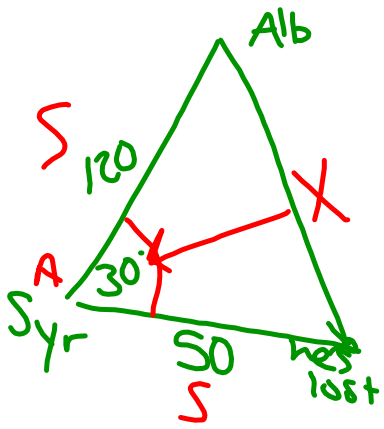
$$\cos C = \frac{16+25-4}{40}$$

$$\cos C = \frac{37}{40}$$

$$\cos^{-1}\left(\frac{37}{40}\right) = \angle C$$

$$\angle C = 22^\circ$$

3) Mr. Solomon is flying from Syracuse to Albany, a distance of 120 miles. He starts his flight 30 off course and flies on this course for 50 miles. How far is he from Albany?



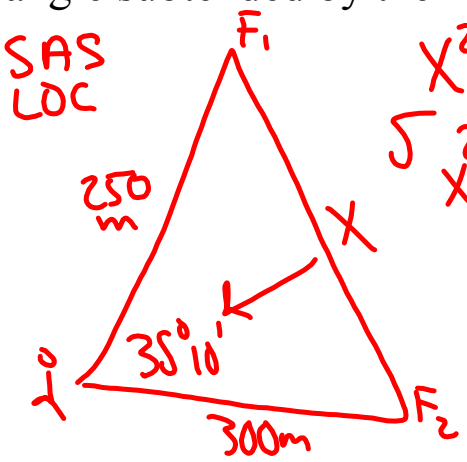
LOC

$x^2 = 120^2 + 50^2 - 2(120)(50)\cos 30$

$\sqrt{x^2} = \sqrt{6507.695}$

$x = 80.670$ 80.7 miles

4) From an observation point ona level corn field, the distance to one of two farms is250 meters and to the other farm is 300 meters. What is the distance, to the nearest tenth, between the farmsif the angle subtended by them at the point of observation is 35°10'?



$X^2 = 250^2 + 300^2 - 2(250)(300)\cos 35°10'$

$\sqrt{X^2} = \sqrt{29877.9828}$

$X = 172.85$

172.9 miles