

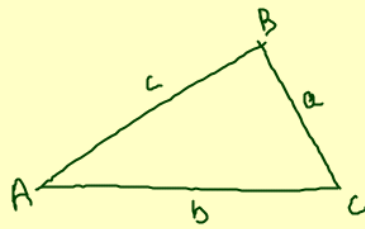
5.6 Law of Cosines

5.6 - 1

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

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

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



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

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

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

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

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

Area of an Oblique Triangle

SAS

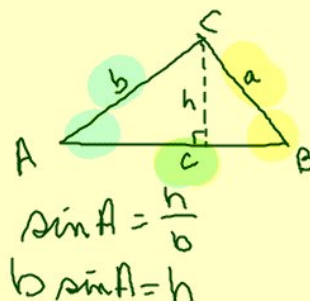
5.6 - 2

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

$$\Delta \text{Area} = \frac{1}{2} \text{base} \times \text{height}$$

$$\boxed{\Delta \text{Area} = \frac{1}{2} c b \sin A}$$

$$\boxed{\Delta \text{Area} = \frac{1}{2} c a \sin B} \quad \Delta \text{Area} = \frac{1}{2} b a \sin C$$



Heron's Formula for Area

Given any triangle with sides of lengths a , b , and c , and let

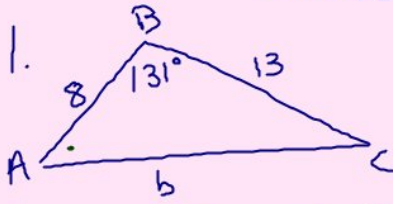
$$s = \text{the semiperimeter} = \frac{(a + b + c)}{2}$$

The area of the triangle is:

$$\text{Area} = \sqrt{s(s - a)(s - b)(s - c)}$$

Homework: 5.6A pg 494: 1-9odd, 15-19odd

5.6B pg 494: 25-31odd, 35 37 41-45odd



$$b^2 = 8^2 + 13^2 - 2(13)(8)\cos 131$$

$$b^2 = 369.460$$

$$b \approx 19.221$$

$$\frac{\sin 131}{19.221} = \frac{\sin A}{13}$$

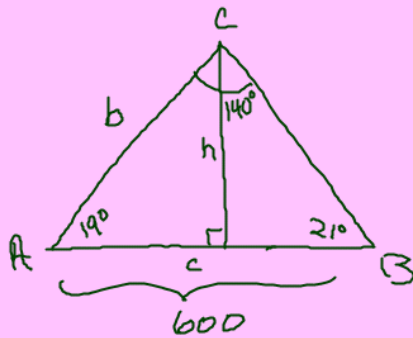
$$\frac{13 \sin 131}{19.221} = \sin A$$

$$.510 \approx \sin A$$

$$30.643 \approx A$$

$$LC \approx 18.307$$

43.



$$\sin 19 = \frac{h}{B}$$

$$B \sin 19 = h$$

$$h = 108.907$$

$$\frac{\sin 140}{600} = \frac{\sin 21}{b}$$

$$b \sin 140 = 600 \sin 21$$

$$b = \frac{600 \sin 21}{\sin 140}$$

$$b \approx 334.513 \rightarrow \textcircled{B}$$

27.



$$\sin 61 = \frac{h}{21}$$

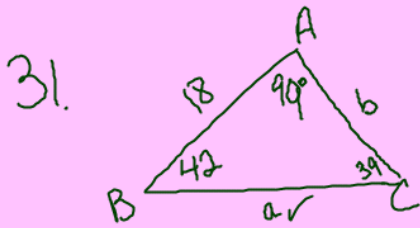
$$21 \sin 61 = h$$

$$18.361 \approx h$$

35



$$\frac{\sin 31}{11} = \frac{\sin A}{8}$$



$$\frac{\sin 99}{a} = \frac{\sin 39}{18}$$

$$a \sin 39 = 18 \sin 99$$

$$a = \frac{18 \sin 99}{\sin 39}$$

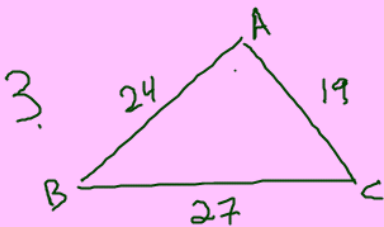
$$a \approx 28.250$$

$$\frac{\sin 42}{b} = \frac{\sin 39}{18}$$

$$b \sin 39 = 18 \sin 42$$

$$b = \frac{18 \sin 42}{\sin 39}$$

$$b \approx 19.139$$



$$27^2 = 24^2 + 19^2 - 2(24)(19)\cos A$$

$$-208 = -2(24)(19)\cos A$$

$$.228 \approx \cos A$$

$$76.817 \approx A$$

15.

