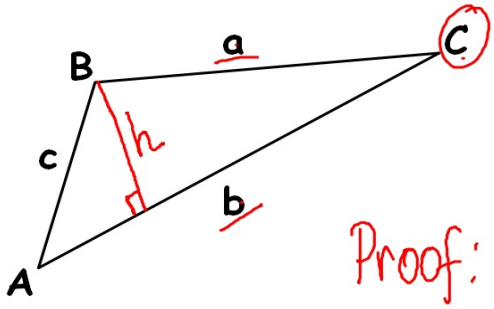
## 13-5/13-6 Area of a Triangle

April 19




(for SAS △s)

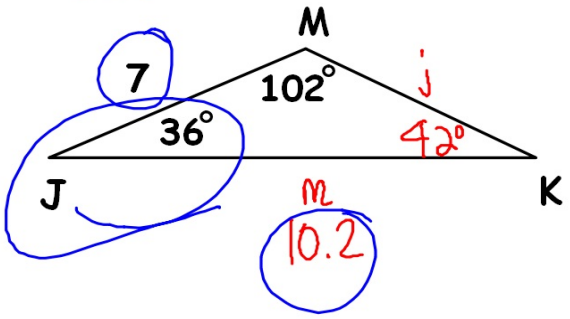
$\Delta \text{ Area} = \frac{1}{2}ab\sin C$

Proof: $\Delta \text{ Area} = \frac{1}{2}hb$

$\sin C = \frac{h}{a} \rightarrow h = a\sin C$

$\Delta \text{ Area} = \frac{1}{2}ab\sin C$

**ex. 1** Find area of $\Delta JKM$




$$\frac{\sin 42^\circ}{7} = \frac{\sin 102^\circ}{m}$$

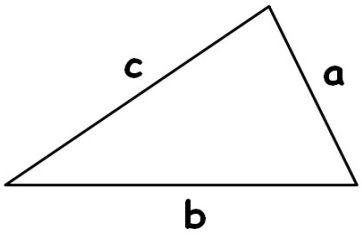
$$\Delta \text{Area} = \frac{1}{2}(7)(10.2)\sin 36^\circ$$

$$\approx 21.0 \text{ units}^2$$

$\therefore$

## Heron's Formula (for SSS$\Delta$s )

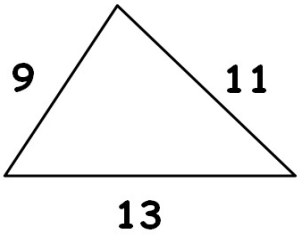
Hero's




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

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

**ex. 2**




$$s = \frac{33}{2} = 16.5$$

$$\Delta \text{Area} = \sqrt{16.5(16.5-9)(16.5-11)(16.5-13)}$$

$$\sqrt{(16.5)(7.5)(5.5)(3.5)}$$

$$\Delta \text{Area} \approx 48.8 \text{ units}^2$$