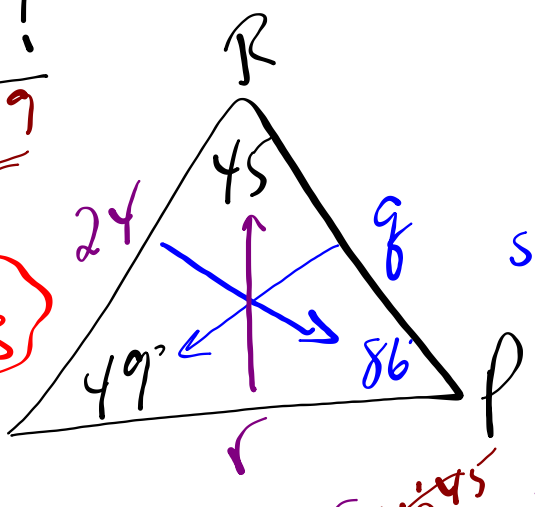
HW ??? 10.7

7) $\frac{a}{\sin A} = \frac{b}{\sin B}$



$\angle P = 86°$

$\frac{q \sin 49°}{\sin 49°} = \frac{24 \sin 49°}{\sin 86°}$

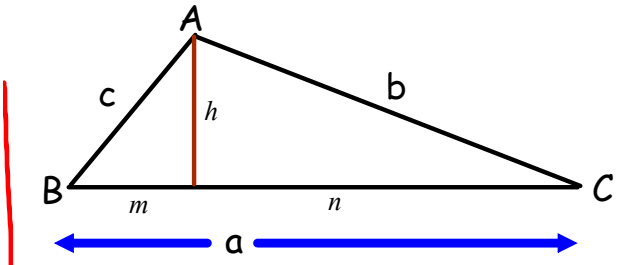
$q = 18.2$

$\frac{r \sin 45°}{\sin 45°} = \frac{24 \sin 45°}{\sin 86°}$

$r = 17.0$

Law of Cosines

Derivation of the law of cosines...



$c^2 = h^2 + m^2$ ← $m = a - n$

$c^2 = h^2 + (a-n)^2$

$c^2 = h^2 + a^2 - 2an + n^2$

$c^2 = h^2 + n^2 + a^2 - 2an$ ← $h^2 + n^2 = b^2$

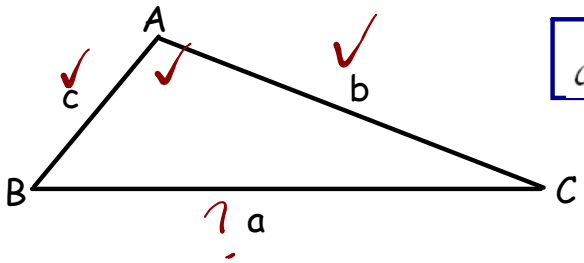
$c^2 = b^2 + a^2 - 2an$ ← $\cos C = \frac{n}{b}$, $n = b\cos C$

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

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

Finding an unknown side... Law of Cosines

- 2 sides and a contained angle (SAS)

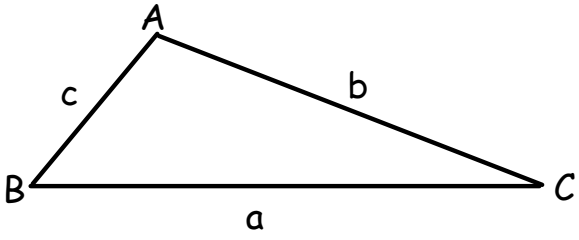


$$a^2 = b^2 + c^2 - 2bc\cos A$$

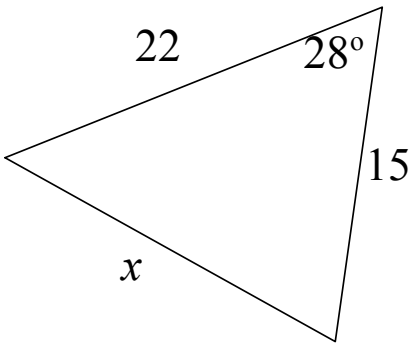
Finding an unknown angle...

- 3 known sides (SSS)

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



EXAMPLE: Finding an unknown side.



* SAS

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

$x^2 = 22^2 + 15^2 - 2(22)(15)\cos 28°$

$x^2 =$

```
22²+15²-2*22*15*
cos(28)
      126.2545887
√(Ans
      11.23630672
```

$x =$

$x = 11.2$

***School wellness activity...finish tomorrow

EXAMPLE: Finding an unknown angle.