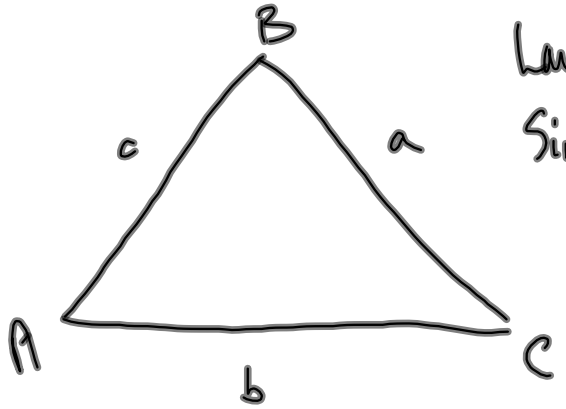
Law of Sines & Law of Cosines



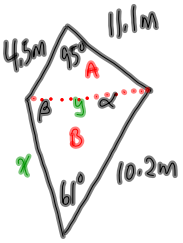
Law of Sines $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

* watch out for SSA when solving for an angle.... there may be 2 solutions.

Law of Cosines: $c^2 = a^2 + b^2 - 2ab\cos C$

Know SAS $\Rightarrow$ the missing side
SSS $\Rightarrow$ find an angle

More Law of Cosines



Find the Area!

Find the Area of A:

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

$\text{Area} = \frac{1}{2}(4.5m)(11.1m)\sin 95^\circ$

$\text{Area} = 24.9m^2$

Use Law of Cosines to find y:

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

$c^2 = 4.5^2 + 11.1^2 - 2(4.5)(11.1)\cos 95^\circ$

$4.5^2+11.1^2-2*4.5*11.1*\cos(95)$
152.1668587
$\sqrt{(Ans}$
12.33559316

$C \doteq 12.3m$

Use Law of Sines to find β

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

$\frac{12.3m}{\sin 61^\circ} = \frac{10.2m}{\sin B}$

$(12.3m)\sin\beta = (10.2m)\sin 61^\circ$

$\sin\beta = \frac{(10.2m)\sin 61^\circ}{12.3m}$

10.2*sin(61)
8.921121013
Ans/12.3
.7252943913
$\sin^{-1}(Ans$
46.49334323

$\beta \doteq 46.5^\circ$ or ~~133.5°~~

Find α:

$\alpha = 180^\circ - (61^\circ + 46.5^\circ)$

$\alpha = 180^\circ - 107.5^\circ$

$\alpha \doteq 72.5^\circ$

We don't really need to find x since we know a side-angle-side (SAS)

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

$\text{Area} = \frac{1}{2}(12.3m)(10.2m)\sin 72.5^\circ$

$\text{Area} \doteq 59.8m^2$

Total
24.9 + 59.8
$= 84.7m^2$

TODO:

p259 | 8, 9, 10 a + b

p260 | 12 + 13