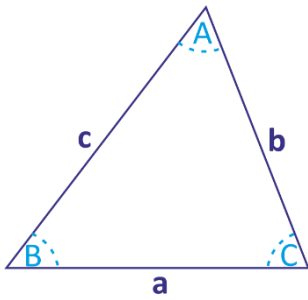


All sides (a, b, c)

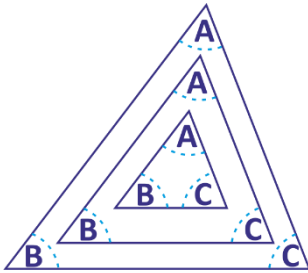


$$A = \cos^{-1} \frac{b^2 + c^2 - a^2}{2bc}$$

$$B = \cos^{-1} \frac{c^2 + a^2 - b^2}{2ca}$$

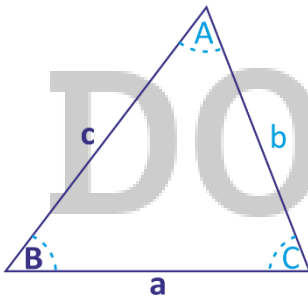
$$C = \cos^{-1} \frac{a^2 + b^2 - c^2}{2ab}$$

All angles (A, B, C)



$$a : b : c = \sin A : \sin B : \sin C$$

Two sides and included angle (a, B, c)

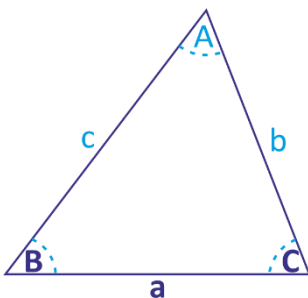


$$b = \sqrt{c^2 + a^2 - 2ca \cos B}$$

$$C = \cos^{-1} \frac{a^2 + b^2 - c^2}{2ab}$$

$$A = \pi - B - C$$

Two angles and included side (a, B, C)

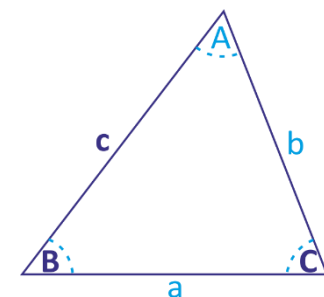


$$A = \pi - B - C$$

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

$$c = \frac{\sin C}{\sin A} a$$

Two angles and non-included side (B, C, c)



$$A = \pi - B - C$$

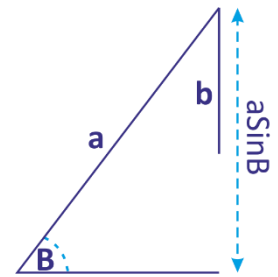
$$a = \frac{\sin A}{\sin C} c$$

$$b = \frac{\sin B}{\sin C} c$$

Two sides and non-included angle (a, b, B)

 $b < a \sin B$ 

No triangle possible

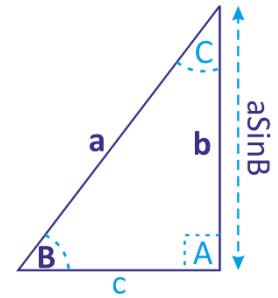
 $b = a \sin B$ 

One triangle possible

$$A = \pi/2$$

$$C = \pi/2 - A$$

$$c = a \cos B$$

 $a > b > a \sin B$ , B acute

Two triangles possible

$$A_1 = \sin^{-1} \left( \frac{a \sin B}{b} \right)$$

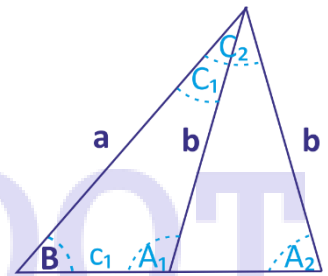
$$A_2 = \pi - \sin^{-1} \left( \frac{a \sin B}{b} \right)$$

$$c_1 = a \cos B + b \cos A_1$$

$$c_2 = a \cos B + b \cos A_2$$

$$C_1 = \pi - A_1 - B$$

$$C_2 = \pi - A_2 - B$$

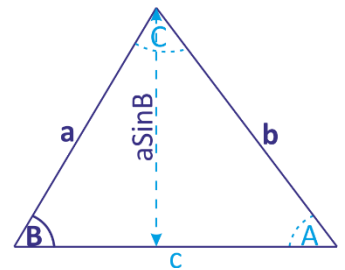
 $b > a > a \sin B$ , B obtuse

One triangle possible

$$A = \sin^{-1} \left( \frac{a \sin B}{b} \right)$$

$$c = a \cos B + b \cos A$$

$$C = \pi - A - B$$

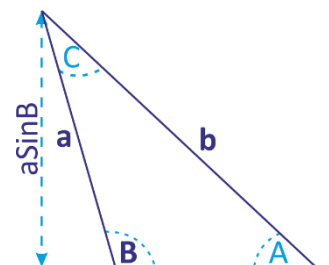
 $b > a > a \sin B$ , B obtuse

One triangle possible

$$A = \sin^{-1} \left( \frac{a \sin B}{b} \right)$$

$$c = a \cos B + b \cos A$$

$$C = \pi - A - B$$

 $a > b > a \sin B$ , B obtuse

No triangle possible

