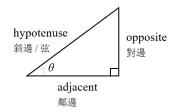
# Geometry -Trigonometry

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### Geometry - Trigonometry



直角三角形的短邊稱之為「勾」, 長邊稱之 為「股」, 斜邊稱之為「弦」。

Mnemonic:「勾三股四弦五」

Pythagoras's theorem (畢氏定理) is also known as「勾股定理」 or「勾股弦定理」.

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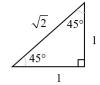
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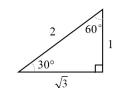
## Geometry - Trigonometry

<u>Useful triangles</u>:





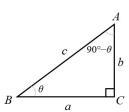




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### Geometry - Trigonometry



$$\cos\theta = \frac{a}{c} = \sin(90^{\circ} - \theta)$$

$$\sin\theta = \frac{b}{c} = \cos(90^{\circ} - \theta)$$

Hence, we have

$$\cos(90^{\circ} - \theta) = \sin\theta$$

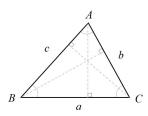
$$\sin(90^{\circ} - \theta) = \cos\theta$$

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# Geometry - Trigonometry



### Sine rule:

$$\begin{cases} a\sin B = b\sin A \\ a\sin C = c\sin A \\ b\sin C = c\sin B \end{cases} \Rightarrow \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

### Cosine rule:

$$c^{2} = (a \sin C)^{2} + (b - a \cos C)^{2}$$
  
$$\Rightarrow c^{2} = a^{2} + b^{2} - 2ab \cos C$$

#### <u>Area</u>:

Area of 
$$\triangle ABC = \frac{1}{2}ab\sin C$$

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