Geometry - Trigonometry

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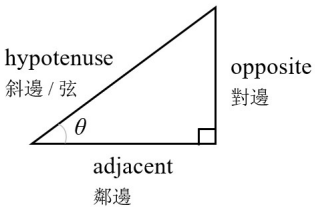

直角三角形的短邊稱之為「勾」，長邊稱之為「股」，斜邊稱之為「弦」。
Mnemonic:「勾三股四弦五」

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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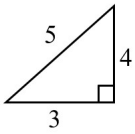
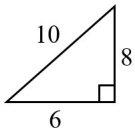
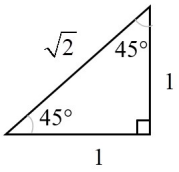
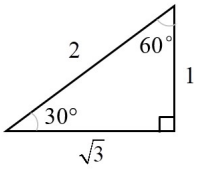
Useful triangles:









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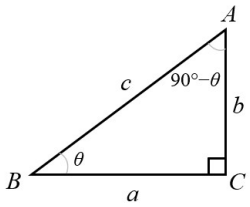


$$\cos\theta = \frac{a}{c} = \sin(90^\circ - \theta)$$

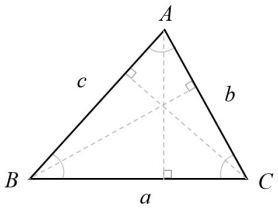
$$\sin\theta = \frac{b}{c} = \cos(90^\circ - \theta)$$

Hence, we have

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

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

Geometry - Trigonometry



Sine rule:

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

Cosine rule:

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

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

Area:

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