

Trigonometric formulae

C2

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

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

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$$A = \frac{1}{2}ab \sin C$$

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$$l_{\text{arc}} = r\theta$$

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$$A_{\text{sector}} = \frac{1}{2}r^2\theta$$

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$$\sin(-\theta) = -\sin \theta, \quad \sin(\pi - \theta) = \sin \theta$$

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$$\cos(-\theta) = \cos \theta, \quad \cos(\pi - \theta) = -\cos \theta$$

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$$\tan(-\theta) = -\tan \theta$$

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$$\tan \theta = \frac{\sin \theta}{\cos \theta}$$

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$$\cos^2 \theta + \sin^2 \theta = 1$$

C3

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$$\sec^2 x = 1 + \tan^2 x$$

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$$\operatorname{cosec}^2 x = 1 + \cot^2 x$$

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$$\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$$

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$$\cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$$

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$$\tan(A \pm B) = \frac{\tan A \pm \tan B}{1 \mp \tan A \tan B}$$

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$$\sin 2A = 2 \sin A \cos A$$

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$$\begin{aligned} \cos 2A &= \cos^2 A - \sin^2 A \\ &= 2 \cos^2 A - 1 \\ &= 1 - 2 \sin^2 A \end{aligned}$$

Trigonometric surds

$\sin 45^\circ = \sin \frac{\pi}{4} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$	$\sin 30^\circ = \sin \frac{\pi}{6} = \frac{1}{2}$	$\sin 60^\circ = \sin \frac{\pi}{3} = \frac{\sqrt{3}}{2}$
$\cos 45^\circ = \cos \frac{\pi}{4} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$	$\cos 30^\circ = \cos \frac{\pi}{6} = \frac{\sqrt{3}}{2}$	$\cos 60^\circ = \cos \frac{\pi}{3} = \frac{1}{2}$
$\tan 45^\circ = \tan \frac{\pi}{4} = 1$	$\tan 30^\circ = \tan \frac{\pi}{6} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$	$\tan 60^\circ = \tan \frac{\pi}{3} = \sqrt{3}$