



Air maths tuition

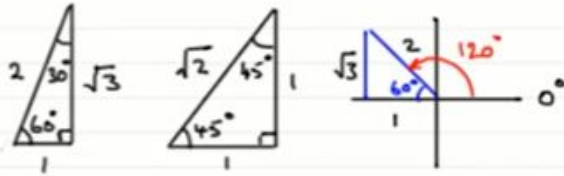
Interact, engage and perform

Finding exact trig ratios using addition formula

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

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

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



$$\cos 75^\circ = \cos(45^\circ + 30^\circ)$$

$$= \cos 45^\circ \cos 30^\circ - \sin 45^\circ \sin 30^\circ$$

$$= \frac{1}{\sqrt{2}} \frac{\sqrt{3}}{2} - \frac{1}{\sqrt{2}} \frac{1}{2}$$

$$= \frac{\sqrt{3} - 1}{2\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}}$$

$$= \frac{\sqrt{2}(\sqrt{3} - 1)}{4}$$

$$\sin 165^\circ = \sin(120^\circ + 45^\circ)$$

$$= \sin 120^\circ \cos 45^\circ + \sin 45^\circ \cos 120^\circ$$

$$= \frac{\sqrt{3}}{2} \frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}} \left(-\frac{1}{2}\right)$$

$$= \frac{\sqrt{3}}{2\sqrt{2}} - \frac{1}{2\sqrt{2}}$$

$$= \frac{\sqrt{3} - 1}{2\sqrt{2}}$$



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