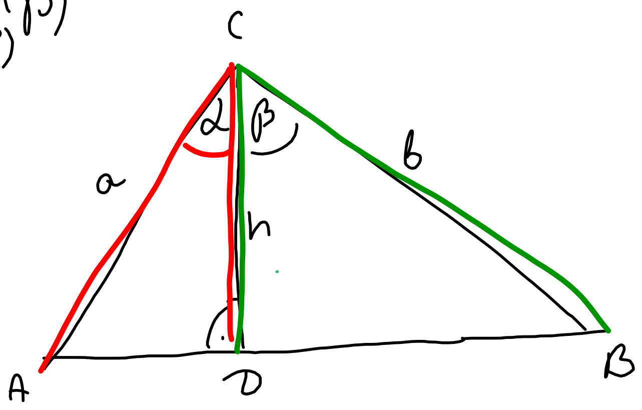
$\sin(\alpha+\beta)$

$\alpha, \beta \in (0, 90^\circ)$



$$P_{ABC} = \underline{\tfrac{1}{2} ab \sin(\alpha+\beta)} = P_{ADC} + P_{BDC} = \underline{\tfrac{1}{2} a \cdot h \cdot \sin\alpha} + \underline{\tfrac{1}{2} b \cdot h \cdot \sin\beta} \quad \Big| : \left(\tfrac{1}{2} ab\right)$$

$$\sin(\alpha+\beta) = \frac{\cancel{a}h}{\cancel{a}b}\sin\alpha + \frac{\cancel{b}h}{a\cancel{b}}\sin\beta = \cos\beta \cdot \sin\alpha + \cos\alpha \sin\beta$$

Tw

$$\sin(\alpha+\beta) = \sin\alpha\cos\beta + \cos\alpha\sin\beta$$

$$\sin(\alpha-\beta) = \sin\alpha\cos\beta - \cos\alpha\sin\beta$$

$$\cos(\alpha+\beta) = \cos\alpha\cos\beta - \sin\alpha\sin\beta$$

$$\cos(\alpha-\beta) = \cos\alpha\cos\beta + \sin\alpha\sin\beta$$

$$tg(\alpha+\beta) = \frac{\sin(\alpha+\beta)}{\cos(\alpha+\beta)}$$

$tg\, 15^\circ =$

$$\boxed{tg\frac{\alpha}{2} = \frac{1-\cos\alpha}{\sin\alpha}} = \frac{-2\sin\frac{\alpha}{2}\sin\frac{\alpha}{2}}{2\sin\frac{\alpha}{2}\cos\frac{\alpha}{2}}$$

$\sin\frac{\alpha}{2}$

$$\cos(2\alpha) = \cos\alpha\cdot\cos\alpha - \sin\alpha\sin\alpha =$$

$$\boxed{\cos(2\alpha) = \cos^2\alpha - \sin^2\alpha} = \cos^2\alpha - (1-\cos^2\alpha) =$$

$$\boxed{\cos 2\alpha = 2\cos^2\alpha - 1}$$

$$\boxed{\cos(2\alpha) = 1 - 2\sin^2\alpha}$$

$$\cos(\alpha - \beta) = \cos(\alpha + (-\beta)) =$$

$$\cos\alpha \cos(-\beta) - \sin\alpha \cdot \sin(-\beta) =$$

$$\cos\alpha \cos\beta + \sin\alpha \sin\beta$$

$\beta = \alpha$ $\quad \cos 0 = \cos\alpha \cos\alpha + \sin\alpha \sin\alpha$

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

$$\cos(\alpha + \beta) = \sin(\underbrace{90 - \alpha}_{\alpha'} - \beta) = \sin(\alpha' - \beta) =$$

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

$$\sin\alpha' \cdot \cos\beta - \cos\alpha' \sin\beta =$$

$$\sin(90 - \alpha) \cdot \cos\beta - \cos(90 - \alpha) \cdot \sin\beta =$$

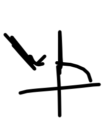
$$= \cos\alpha \cos\beta - \sin\alpha \sin\beta$$

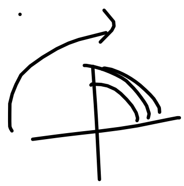
$\sin(\underbrace{90^\circ - \alpha}_{\mathrm{I}\ 300^\circ}) = +\cos\underset{300}{\alpha} = \cos(300^\circ) =$

$\overline{\mathrm{II}}$

$= \cos(\boxed{90} + 210^\circ) = -\sin 210^\circ = -\sin(\boxed{90+}120) =$

II





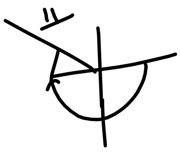
$- \underline{\cos 120} =$

$- \cos(\underset{\mathrm{II}}{90} + 30) = - - \sin 30$

$\frac{1}{2}$

$\sin(9\underline{0 - 30}0) = \sin(\underbrace{-210}) = \sin 30 = \frac{1}{2}$

$\overline{\mathrm{II}}$



si

TW $\sin(\alpha+\beta) = \sin\alpha\cos\beta + \cos\alpha\sin\beta$

$\beta = \alpha$

$\sin(\alpha+\beta) = \boxed{\sin 2\alpha = 2\sin\alpha\cos\alpha}$

$1 + \sin 2\alpha = \sin^2\alpha + \cos^2\alpha + 2\sin\alpha\cos\alpha = (\sin\alpha + \cos\alpha)^2$

$\sin 105^\circ = \sin(45^\circ + 60^\circ) = \sin 45 \cos 60 + \cos 45^\circ \cdot \sin 60^\circ =$

$= \frac{\sqrt{2}}{2} \cdot \frac{1}{2} + \frac{\sqrt{2}}{2} \cdot \frac{\sqrt{3}}{2} = \frac{\sqrt{2}+\sqrt{6}}{4}$

$\cos(\underset{90}{0} - \beta) = \cos\beta$

$\sin(\alpha - \beta) = \sin(\alpha + (-\beta)) =$

$\sin\alpha \cdot \cos(-\beta) + \cos\alpha \cdot \sin(-\beta) =$

$\sin\alpha \cdot \cos\beta - \cos\alpha \sin\beta$

$$\sin(-\beta) = \sin(\underbrace{0\cdot 90^\circ - \boxed{\beta}}_{\mathrm{IV}}) = -\sin\beta$$