

# General - Notes

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## Useful Trig Identities

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

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

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

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

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

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

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

$$\sin(2x) = 2.\sin(x).\cos(x)$$

$$\cos(2x) = \cos^2(x) - \sin^2(x)$$

$$= 2\cos^2(x) - 1$$

$$= 1 - 2\sin^2(x)$$

$$\sin^2(x) = \frac{1 - \cos(2x)}{2}$$

$$\cos^2(x) = \frac{1 + \cos(2x)}{2}$$

$$\tan^2(x) = \frac{1 - \cos(2x)}{1 + \cos(2x)}$$

$$\sin(x) + \sin(y) = 2.\sin\left(\frac{x+y}{2}\right).\cos\left(\frac{x-y}{2}\right)$$

$$\sin(x) - \sin(y) = 2.\sin\left(\frac{x-y}{2}\right).\cos\left(\frac{x+y}{2}\right)$$

$$\cos(x) + \cos(y) = 2.\cos\left(\frac{x+y}{2}\right).\cos\left(\frac{x-y}{2}\right)$$

$$\cos(x) - \cos(y) = -2.\sin\left(\frac{x+y}{2}\right).\sin\left(\frac{x-y}{2}\right)$$