

# FORMULARIUM GONIOMETRIE

## Grondformule en afgeleide formules

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

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

$$\sin^2 \alpha = 1 - \cos^2 \alpha \quad (3)$$

- $1 + \operatorname{tg}^2 \alpha = \frac{1}{\cos^2 \alpha}$  (4)

$$1 + \operatorname{cotg}^2 \alpha = \frac{1}{\sin^2 \alpha} \quad (5)$$

## Som- en verschilformules

- $\sin(\alpha + \beta) = \sin \alpha \cos \beta + \cos \alpha \sin \beta$  (6)

$$\sin(\alpha - \beta) = \sin \alpha \cos \beta - \cos \alpha \sin \beta \quad (7)$$

- $\cos(\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta$  (8)

$$\cos(\alpha - \beta) = \cos \alpha \cos \beta + \sin \alpha \sin \beta \quad (9)$$

- $\operatorname{tg}(\alpha + \beta) = \frac{\operatorname{tg} \alpha + \operatorname{tg} \beta}{1 - \operatorname{tg} \alpha \operatorname{tg} \beta}$  (10)

$$\operatorname{tg}(\alpha - \beta) = \frac{\operatorname{tg} \alpha - \operatorname{tg} \beta}{1 + \operatorname{tg} \alpha \operatorname{tg} \beta} \quad (11)$$

## Verdubbelingsformules

$$\sin 2\alpha = 2 \sin \alpha \cos \alpha \quad (12)$$

$$\cos 2\alpha = \cos^2 \alpha - \sin^2 \alpha \quad (13)$$

$$= 1 - 2 \sin^2 \alpha \quad (14)$$

$$= 2 \cos^2 \alpha - 1 \quad (15)$$

$$\operatorname{tg} 2\alpha = \frac{2 \operatorname{tg} \alpha}{1 - \operatorname{tg}^2 \alpha} \quad (16)$$

## Halveringsformules

$$\sin \frac{\alpha}{2} = \pm \sqrt{\frac{1 - \cos \alpha}{2}} \quad (17)$$

$$\cos \frac{\alpha}{2} = \pm \sqrt{\frac{1 + \cos \alpha}{2}} \quad (18)$$

$$\operatorname{tg} \frac{\alpha}{2} = \pm \sqrt{\frac{1 - \cos \alpha}{1 + \cos \alpha}} \quad (19)$$

## Formules van Simpson

$$\sin x + \sin y = 2 \sin \frac{x+y}{2} \cos \frac{x-y}{2} \quad (20)$$

$$\sin x - \sin y = 2 \cos \frac{x+y}{2} \sin \frac{x-y}{2} \quad (21)$$

$$\cos x + \cos y = 2 \cos \frac{x+y}{2} \cos \frac{x-y}{2} \quad (22)$$

$$\cos x - \cos y = -2 \sin \frac{x+y}{2} \sin \frac{x-y}{2} \quad (23)$$

## $t$ -formules

$$\sin \alpha = \frac{2 \operatorname{tg} \frac{\alpha}{2}}{1 + \operatorname{tg}^2 \frac{\alpha}{2}} = \frac{2t}{1+t^2} \quad (24)$$

$$\cos \alpha = \frac{1 - \operatorname{tg}^2 \frac{\alpha}{2}}{1 + \operatorname{tg}^2 \frac{\alpha}{2}} = \frac{1-t^2}{1+t^2} \quad (25)$$