

- Suma y diferencia de ángulos

$$\operatorname{sen}(x \pm y) = \operatorname{sen}(x) \cos(y) \pm \cos(x) \operatorname{sen}(y)$$

$$\cos(x \pm y) = \cos(x) \cos(y) \mp \operatorname{sen}(x) \operatorname{sen}(y)$$

$$\tan(x \pm y) = \frac{\tan(x) \pm \tan(y)}{1 \mp \tan(x) \tan(y)}$$

- Angulo doble

$$\operatorname{sen}(2x) = 2 \operatorname{sen}(x) \cos(x)$$

$$\cos(2x) = \cos^2(x) - \operatorname{sen}^2(x) = 2 \cos^2(x) - 1 = 1 - 2 \operatorname{sen}^2(x)$$

- Angulo mitad

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

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

$$\tan\left(\frac{x}{2}\right) = \frac{1 - \cos(x)}{\operatorname{sen}(x)} = \frac{\operatorname{sen}(x)}{1 + \cos(x)}$$

- Producto

$$\operatorname{sen}(x) \operatorname{sen}(y) = \frac{1}{2}[\cos(x - y) - \cos(x + y)]$$

$$\cos(x) \cos(y) = \frac{1}{2}[\cos(x - y) + \cos(x + y)]$$

$$\operatorname{sen}(x) \cos(y) = \frac{1}{2}[\operatorname{sen}(x + y) + \operatorname{sen}(x - y)]$$

### A.6.5 Identidades trigonométricas

- Identidades pitagóricas

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

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

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