

## • Limiti di successioni.

$$1) \lim_n n^2 \left(1 - \cos \frac{2}{n}\right)$$

$$2) \lim_n (2n+1) \left(e^{\frac{1}{n}} - 1\right)$$

$$3) \lim_n (1-n^2) \sin\left(\frac{2}{n^2+1}\right)$$

$$4) \lim_n \frac{(n+2)! \cdot (n-1)^n}{n^{n+2} \cdot n!}$$

$$5) \lim_n \frac{e^{\frac{1}{n}} - 1}{n!} (n+1)!$$

$$6) \lim_n \frac{\ln 2^n (4n)^n}{(n+1)^{n+1} \cdot 2^{2n}}$$

## • Derivate.

$$1) f(x) = \sqrt{\sin(2x)}$$

$$2) f(x) = \tan \sqrt{x}$$

$$3) f(x) = \frac{x^2+5}{(x+1)^2}$$

$$4) f(x) = \frac{(2x+1)^2}{(x-2)^3}$$

$$5) f(x) = \frac{1}{\ln^2 x}$$

$$6) f(x) = (\cos^2 x - \cos 2x)^2$$

## • Equazione della retta tangente.

$$1) f(x) = \frac{x^3}{x+1} \quad \text{in } x_0 = -2$$

$$2) f(x) = 2 \ln^2 x - x^2 \quad \text{in } x_0 = 1$$

$$3) f(x) = \ln(4x^2-3) \quad \text{in } x_0 = -1$$

## • Teorema di Rolle.

$$1) f(x) = \frac{1}{x^2+1}, \quad I = [-1, 1]$$

$$[c=0]$$

$$2) f(x) = -x^4 + 2x^2 + 3, \quad I = [-3, 3]$$

$$[c=\pm 1, c=0]$$

$$3) f(x) = \ln(-x^2+9), \quad I = [-2, 2]$$

$$[c=0]$$