

### S.3 Maclaurin polynomial approx. of a func.

$$F(x) = \frac{1}{1+x} \quad \text{at } x=0$$

$$\sum_{n=0}^{\infty} (-1)^n x^n$$

$$F(x) = (1+x)^{-1}$$

$$F(0) = 1$$

$$F'(x) = -1(1+x)^{-2}$$

$$F'(0) = -1$$

$$F''(x) = 2(1+x)^{-3}$$

$$F''(0) = 2 \text{ or } 2!$$

$$F'''(x) = -6(1+x)^{-4}$$

$$F'''(0) = -6 \text{ or } 3!$$

$$F^{(4)}(x) = 24(1+x)^{-5}$$

$$F^{(4)}(0) = 24 \text{ or } 4!$$

$$1 + \frac{-1}{1!}x + \frac{2}{2!}x^2 + \frac{-6}{3!}x^3 + \frac{24}{4!}x^4 \dots$$

$$1 - x + x^2 - x^3 + x^4$$