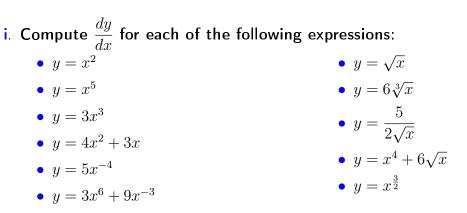
## **Basic Differentiation**



ii. Calculate the derivative (f'(x)) for each of the following functions:

• 
$$f(x) = 3$$

• 
$$f(x) = -x$$

• 
$$f(x) = \frac{1}{x^2}$$

• 
$$f(x) = 6x^{10}$$

• 
$$f(x) = \frac{5}{x^2 + x}$$
  
•  $f(x) = \frac{3}{4}x^{-\frac{1}{2}}$ 

iii. A water tank is filled with water at a rate depending on time. The volume of water, in litres, being added at a time t seconds, is given by:

$$v(t) = 4t^2 + 2, \qquad 0 \le t \le 10$$

- What is the rate of change in volume of water being added to the tank?
- Find the rate of change of v when t = 5
- What is the rate of change of v initially?
- iv. Compute the derivative of each of the following functions:

• 
$$f(x) = (2x+5)(x-1)$$
  
•  $g(x) = \frac{x^2+5x-3}{x}$   
•  $h(x) = \frac{3x^4+9x-7x^2}{x^2}$   
•  $y(x) = \frac{(x+4)^2}{x}$