

1. Find  $f'(a)$  using the definition of the derivative:

$$f(t) = 2t^2 + t$$

2. Find  $f'(3)$  using the definition of the derivative:

$$f(x) = x^{-2}$$

3. Find  $f'(a)$  using the definition of the derivative:

$$f(x) = \sqrt{1 + 5x}$$

4. Find an equation of the tangent line to the curve at the given point:

$$f(x) = \frac{x+1}{x-1}, \quad (2, 3)$$

Also sketch both the curve  $y = f(x)$  and the tangent line.

5. A particle moves a distance  $s = f(t)$  along a straight line, where  $s$  is measured in meters and  $t$  is in seconds:

$$f(t) = 40t - 5t^2$$

Find the velocity and speed when  $t = 4$ .