1. La velocidad del móvil a los 5 segundos es de 30 m/s

2. i) $f'(2) = 14$

   ii) a) $f'(x) = -\frac{1}{x^2}$ b) $f'(x) = 0$

3. a) $y_T = x - 1/2$ $y_N = -x + 3/2$

   b) $y_T = 1/4\ x - 3/4$ $y_N = -4x + 12$

4. a), c) y d)

5. a) f es continua y no derivable en a = 2

   b) f es continua y derivable en a = 1

6. a) $f'(x) = 3x^2 + 6$ b) $f'(x) = -\frac{2}{(x+1)^2}$

   c) $f'(x) = 1 \quad \forall x > 0$ d) $f'(x) = -\frac{1}{x^2} + 3x^4(5\cos x - x\,sen\,x)$

   e) $f'(x) = \frac{-2(\cos x + sen\,x) + 1}{(2 - \cos x)^2}$

   f) f'(x) = m g) $f'(x) = \frac{\ln x}{\cos^2 x} + \frac{tg\,x}{x}$

   h) $f'(x) = \frac{1}{\sqrt{2}} e^x (x + 2)$

   i) $f'(x) = -sen\,x + \frac{\cos x - \ln 2\, sen\,x}{2^x}$

   j) $f'(x) = 6x^2 + \frac{7}{2\sqrt{x^5}} - \frac{1}{3\sqrt[3]{x^4}}$ k) $f'(x) = \left(x^2 + \frac{5\sqrt[3]{x^4}}{3}\right)\frac{1}{(x + \sqrt[3]{x})^2}$

   l) $f'(h) = \frac{2a(-2h^5 - 6h^3 + 1)}{(h^5 + 6h^3 + 2)^2}$

   m) $f'(x) = \left(\frac{1}{2\sqrt{x}} + 1\right)(x^2 + 3x - 2) + (\sqrt{x} + x)(2x + 3)$

7. P = (-2; 1)

8. En $t = v_0/g$

9. a) $g \circ f : R \to R; \quad (g \circ f)(x) = 3sen\,x + 1$

$f \circ g : R \to R; \quad (f \circ g)(x) = sen(3x+1)$

b) $g \circ f : R \to R; \quad (g \circ f)(x) = 4e^{x} - 3$

$f \circ g : R \to R; \quad (f \circ g)(x) = e^{4x-3}$

c) $g \circ f : R^{+} \to R; \quad (g \circ f)(x) = 2\log x - 3$

$f \circ g : (3/2; +\infty) \to R; \quad (f \circ g)(x) = \log(2x-3)$

d) $g \circ f : (-\infty; 0] \to R; \quad (g \circ f)(x) = \sqrt{-x} - 5$

$f \circ g : (-\infty; 5] \to R; \quad (f \circ g)(x) = \sqrt{5-x}$

10. a) $f'(x) = 3(3x + x^4)^2(3 + 4x^3)$

b) $f'(t) = 2\cos(2t) + sen\ 2$ c) $f'(x) = -\dfrac{x}{4-x^2}$

d) $f'(x) = \dfrac{2\ln x}{x} + \dfrac{2}{x}$ e) $f'(x) = \dfrac{3x^2\cos(x^3)}{sen(x^3)} - \dfrac{sen(\sqrt[3]{\ln(2x)})}{3x\sqrt[3]{(\ln(2x))^2}}$

f) $f'(x) = \dfrac{2x\ sen(3x) + 3x^2\cos(3x)}{3\sqrt[3]{(x^2 sen(3x))^2}}$

11. $v_0\, e^{\frac{-3t}{m}}$,

12. $y'(12) = 0{,}02\ e^{1{,}2}$

13. a) $f'(x) = 2x^{\ln x}\dfrac{\ln x}{x}$

b) $f'(x) = (\ln x)^x\left(\ln(\ln x) + \dfrac{1}{\ln x}\right)$

14. P = (0; 0) Q = (2/3; $e^{-2}/9$)

15. a) $f'(x) = 5x^4 + 24x^3 + 3$ $f''(x) = 20x^3 + 72x^2$ $f'''(x) = 60x^2 + 144x$

b) $f'(x) = -6x^2e^{-2x^3+1}$ $f''(x) = -e^{-2x^3+1}(12x - 36x^4)$

$f'''(x) = e^{-2x^3+1}(216x^3 - 12 - 216x^6)$

c) $f'(x) = 1 + \ln x$ $f''(x) = \dfrac{1}{x}$ $f'''(x) = -\dfrac{1}{x^2}$