

$$1) g(t) = 6t^{5/3}$$

$$g'(t) = 10t^{2/3}$$

$$2) B(x) = \frac{8x^2 - 6x + 11}{x - 1}$$

$$B'(x) = \frac{(x-1)(16x-6) - (8x^2-6x+11)}{(x-1)^2}$$

$$3) f(s) = 15 - s - 4s^2 - 5s^4$$

$$f'(s) = -1 - 8s - 20s^3$$

$$4) G(v) = \frac{v^3 - 1}{v^3 + 1}$$

$$G'(v) = \frac{(v^3+1)(3v^2) - (v^3-1)(3v^2)}{(v^3+1)^2}$$

$$5) f(x) = 3x^2 + \sqrt[3]{x^4}$$

$$f'(x) = 6x + \frac{4}{3}x^{1/3}$$

$$6) g(t) = \frac{\sqrt[3]{t^2}}{3t-5}$$

$$g'(t) = \frac{(3t-5)(\frac{2}{3}t^{-1/3}) - t^{2/3}(3)}{(3t-5)^2}$$

$$7) p(x) = 1 + x^{-1} + x^{-2} + x^{-3}$$

$$p'(x) = -x^{-2} - 2x^{-3} - 3x^{-4}$$

$$8) k(x) = (2x^2 - 4x + 1)(6x - 5)$$

$$k'(x) = (2x^2 - 4x + 1)(6) + (6x - 5)(4x - 4)$$

$$9) h(x) = x^{2/3}(3x^2 - 2x + 5)$$

$$h'(x) = x^{2/3}(6x - 2) + \frac{2}{3}x^{-1/3}(3x^2 - 2x + 5)$$

$$10) M(x) = \frac{2x^3 - 7x^2 + 4x + 3}{x^2}$$

$$M(x) = 2x - 7 + 4x^{-1} + 3x^{-2}$$

$$M'(x) = 2 - 4x^{-2} - 6x^{-3}$$

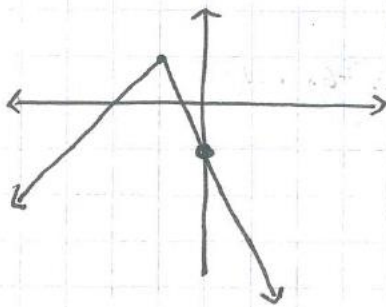
$$11) f(x) = \frac{4x-5}{3x+2}$$

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

$$12) f(x) = (1 + x + x^2 + x^3)^{-1}$$

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

$$13) f(0) = -1 \quad f'(x) = \begin{cases} 1, & x < -1 \\ -2, & x > -1 \end{cases}$$



$$14) f(x) = x^2 + x$$

$f'(x) = 2x + 1$ is cont
on $(-\infty, \infty)$

$$15) f(x) = 4 - 3x$$

$$f'(x) = -3$$

$$f'(-1) = -3$$

$$16) f(x) = \begin{cases} x^3, & x \leq 1 \\ 3x + k, & x > 1 \end{cases}$$

$$\lim_{x \rightarrow 1^-} x^3 = \lim_{x \rightarrow 1^+} (3x + k)$$

$$1 = 3 + k$$

$$\boxed{-2 = k}$$

$$\lim_{x \rightarrow 1^-} \frac{x^3 - 1}{x - 1} = \lim_{x \rightarrow 1^+} \frac{(3x - 2) - 1}{x - 1}$$

$$\lim_{x \rightarrow 1^-} \frac{(x-1)(x^2+x+1)}{x-1} = \lim_{x \rightarrow 1^+} \frac{3x-3}{x-1}$$

$$3 = 3 \quad \checkmark$$