a) $f(x) = 3x^3 - 2x^2 + 4 \Rightarrow f'(x) = 9x^2 - 4x$

b) $f(x) = 3x + \sqrt{x} \Rightarrow f'(x) = 3 + \dfrac{1}{2\sqrt{x}}$

c) $f(x) = (3x^2 + 2x + 4)(x^4 - 5) \Rightarrow f'(x) = (6x + 2)(x^4 - 5) + (3x^2 + 2x + 4)(4x^3)$

$\Rightarrow f'(x) = 6x^5 - 30x + 2x^4 - 10 + 12x^5 + 8x^4 + 16x^3$

$\Rightarrow f'(x) = 18x^5 + 10x^4 + 16x^3 - 30x - 10$

d) $f(x) = \dfrac{x}{x^2 + 1} \Rightarrow f'(x) = \dfrac{1}{x^2 + 1} + x \cdot \left(\dfrac{-2x}{(x^2+1)^2}\right)$

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

e) $f(x) = 5 + 3x^{-2} \Rightarrow f'(x) = -6x^{-3}$