1. Using the definition of the derivative \( f'(x) = \lim_{h \to 0} \frac{f(x + h) - f(x)}{h} \),

(a) find \( f'(x) \) for \( f(x) = \frac{1}{3x+1} \)

(b) find \( f'(x) \) for \( f(x) = \sqrt{x + 1} \)

2. A stone dropped into a pond of water at time \( t = 0 \) seconds causes a circular ripple that travels outward from the point of impact. If the radius of the ripple is increasing at 6 feet/sec, at what rate is the area of the circle enclosed by the ripple increasing at \( t = 10 \) seconds?
3. Using the basic differentiation rules, find the derivatives indicated of the following functions (Do Not Simplify Your Answers):

(a) \( f'(x) \) for \( f(x) = -x^5 + 32x^3 + 12 - 2x^{-3} \)

(b) \( g'(t) \) for \( g(t) = (1 - 4t^2)(2t^3 - 5t + 1) \)

(c) \( h'(1) \) for \( h(x) = \frac{3x^3 - 4x + 6}{3 + 4x - 4x^5} \)