

The deadline for all homework assignments is the one specified in Archie before 11:59 pm. As discussed in class, It must be correctly uploaded in order to be graded. Show all your work and justifications.

Compute the following derivatives at  $x$

(1)  $f(x) = \sqrt[3]{x}(\sqrt{x} + 3)$

(2)  $h(x) = (x^2 - 1)^2$

(3)  $f(x) = (2x^3 + 5x)(x - 3)(x + 2)$

(4)  $f(x) = (x^3 - x)(x^2 + 2)(x^2 + x - 1)$

(5)  $g(x) = (x^2 + 3)(x^2 - 4x)$

(6)  $h(t) = \sqrt{t}(1 - t^2)$

(7)  $f(x) = x^3 \cos x$

(8)  $f(x) = (6x + 5)(x^3 - 2)$

(9)  $g(s) = \sqrt{s}(s^2 + 8)$

(10)  $g(x) = \sqrt{x} \sin x$

Compute the following derivatives at  $x$ , where the function is differentiable:

(1)  $\frac{d}{dx} x^2 \sin(x).$

(2)  $\frac{d}{dx} x^4 \sin(x^5).$

(3)  $\frac{d}{dx} x^5 \sin^7(x^6).$

(4)  $\frac{d}{dx} \sin^7(\sqrt[5]{x^2 + 8x}).$