

Problem 1. Find the first and second derivatives of the following functions

i) $f(x) = 3x^4 - 2x^3 + 10x^2$

v) $h(s) = \frac{s-1}{s+1}$

ii) $f(x) = (x+1)^{10}$

vi) $g(u) = \frac{u^2}{u^2+1}$

iii) $f(x) = (2x^2 - 1)^4$

vii) $f(x) = \sqrt{2x+3x^2}$

iv) $g(x) = \frac{2x}{\sqrt{x+1}}$

viii) $g(x) = \frac{\sqrt{2x+1}}{\sqrt{1-3x}}$

Problem 2. Find the third derivative of the following functions

i) $f(x) = \frac{1}{x}$

iii) $h(s) = (2+3s)^4$

ii) $g(t) = \sqrt{3t+1}$

iv) $f(x) = (\frac{1}{2}x^2 - 1)^5$

In addition to the above, you should do the following

- section 3.4 questions 3-17
- section 3.5 questions 1-28