The Maclaurin series for the function f is given by

$$f(x) = \sum_{n=0}^{\infty} \frac{(-1)^n (3x)^{n+1}}{n+1} = 3x - \frac{9x^2}{2} + 9x^3 - \frac{81x^4}{4} + \cdots + \frac{(-1)^n (3x)^{n+1}}{n+1} + \cdots$$

on its interval of convergence.

a)   Find the interval of convergence of the Maclaurin series for f.

b)   Show that $\left| P_4 (0.1) - f'(0.1) \right| \le .0005$.

c)   Find the first four terms and the general term for the Maclarin series for $f'(x)$

d)   Find the function that represents the sum of the series in part (b)

e)   Use the answer you found in part (c) to find the value of $f'\left(\dfrac{-1}{2} \right)$