MCS21 Homework 17

Do all work on a separate sheet of paper.

1.   If $f(x) = \left(1 + \sqrt{x}\right)\left(x^3\right)$, find $f'(x)$ in simplest form.

2.   If $y = \dfrac{x^3 + 5x + 7}{x^2 + 7x + 9}$, find $\dfrac{dy}{dx}$ in simplest form.

3.   Find $\dfrac{dx}{dt}$ in simplest form if $x = \dfrac{3 - \dfrac{1}{t}}{t + 5}$.

4.   If $g(x) = \dfrac{x^3 + 4}{2x^2 + x - 9}$, find $g'(x)$ in simplest form.

5.   Find $\dfrac{dy}{dx}\bigg|_{x=1}$ if $y = \left(2x^7 - x^2\right)\left(\dfrac{x-1}{x+1}\right)$.

6.   Given $f(2) = -4$, $f'(2) = 1$, $g(2) = -5$, and $g'(2) = 6$.

     (a) Find $h'(2)$ if $h(x) = f(x) \cdot g(x)$

     (b) Find $h'(2)$ if $h(x) = \dfrac{f(x)}{g(x)}$

     (c) Find $h'(2)$ if $h(x) = \dfrac{2x+1}{g(x)}$

     (d) Find $h'(2)$ if $h(x) = (6x^2 - 5x) \cdot f(x)$