

MCS21 Homework 21

Do all work on a separate sheet of paper.

1. If $f(x) = (1 + \sqrt{x})(x^3)$, find $f'(x)$ in simplest form.
2. If $y = \frac{x^3 + 5x + 7}{x^2 + 7x + 9}$, find $\frac{dy}{dx}$ in simplest form.
3. Find $\frac{dx}{dt}$ in simplest form if $x = \frac{3 - \frac{1}{t}}{t + 5}$.
4. If $g(x) = \frac{x^3 + 4}{2x^2 + x - 9}$, find $g'(x)$ in simplest form.
5. Find $\left. \frac{dy}{dx} \right|_{x=1}$ if $y = (2x^7 - x^2) \left(\frac{x-1}{x+1} \right)$.
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 $h(x) = \frac{f(x)}{g(x)}$
 - (c) Find $h'(2)$ if $h(x) = \frac{2x+1}{g(x)}$
 - (d) Find $h'(2)$ if $h(x) = (6x^2 - 5x) \cdot f(x)$