4.9: Antiderivatives

ex1: Find the antiderivatives (General)

(a) $f'(x) = 8x^9 - 3x^6 + 12x^3$

(b) $g'(x) = \sqrt[4]{x^3} + \sqrt[3]{x^4}$

(c) $h'(x) = \dfrac{2 + x^2}{1 + x^2}$

ex2: Find the specific antiderivative

(a) $f'(x) = 2x - \dfrac{1}{x^4}$, $x > 0$ given $f(1) = 3$

(b) $g'(x) = \dfrac{4}{\sqrt{1 - x^2}}$, $g(\frac{1}{2}) = 1$

(c) $h''(x) = 2e^x + 3\cos x$, $h(0) = 0$; $h(\pi) = 0$.

ex3: A particle is moving w/ $a(t) = t^2 - 4t + 6$
and positions $s(0) = 5$ and $s(1) = 20$.

Important Notes:

Dfn: A fct F is called an <u>antiderivative</u> of f on
an interval I if $F'(x) = f(x)$ for all x in I.

Thm: If F is an antideriv. of f then the most
general antideriv of f on I is $F(x) + c$.