

MATH 1000 – DALHOUSIE UNIVERSITY – SUMMER 2010

Assignment 8 – Due Monday August 9

- Find the most general antiderivative of the following functions.
 - $f(x) = x^2 + x + 1$.
 - $f(x) = \frac{5}{x^3}$, where $x \neq 0$.
 - $f(x) = \frac{5 - 4x^3 + 2x^6}{x^6}$, where $x \neq 0$.
 - $f(x) = \frac{3}{x^2 + 1}$.
 - $f(\theta) = \sin \theta + \cos \theta - \sec^2 \theta$.
 - $f(x) = 4e^x + \frac{6}{x}$.
- Find f if $f'(x) = 8x^3 + 12x + 3$ and $f(1) = 6$.
 - Find f if $f'(x) = 6x + \sin x$ and $f(0) = 4$.
 - Find f if $f''(x) = 4 - 6x - 40x^3$ and $f(0) = 2, f'(0) = 1$.
- Find a general solution for $f(x)$ if $f''(x) = 30x - 2$.
(Note: the solution will have two constants in it; you can label them C, D or C_1, C_2 , etc.)
- A particle is moving with velocity function $v(t) = 1.5\sqrt{t}$ and its initial position is 0m. Use antidifferentiation to find its position formula, $s(t)$. What is its position at $t = 4$ seconds?
- A particle is moving with acceleration function $a(t) = \cos t + \sin t$. Its initial position is 0m and its initial velocity is 5m/s.
 - What are the corresponding velocity and position functions?
 - What is the velocity after $\frac{\pi}{2}$ seconds?
 - What is the position after π seconds?