**Dawson College: Calculus 1**: 201-NYA-05-C3: Winter 2008: Saturday. May 3rd

**Name:**
**Student ID:** SOLUTIONS

# Quiz 10

This quiz is graded out of 10 marks. No books or notes are allowed. SHOW ALL YOUR WORK. If you need more space for your answer use the back of the page.

**Question 1.** *(5 marks)*
Find $h(t)$ given $h''(t) = 1$, $h'(0) = 1$ and $h(2) = 1$.

$$h'(t) = \int h''(t)\,dt = \int 1\,dt = t + C$$

$$h'(0) = 1 \quad \text{so} \quad 0 + C = 1 \quad C = 1$$

$$h'(t) = t + 1$$

$$h(t) = \int t + 1\,dt = t^2/2 + t + C$$

$$h(2) = 1 \implies 2^2/2 + 2 + C = 1 \implies C = -3$$

$$\boxed{h(t) = t^2/2 + t - 3}$$

**Question 2.** *(5 marks)*
Compute the integral.

$$\int \frac{4x}{\sqrt{x^2+1}}dx$$

Let $u = x^2 + 1$ $\quad du = 2x\,dx$

$$dx = \frac{du}{2x}$$

$$\int \frac{4x}{\sqrt{x^2+1}}\,dx = \int \frac{4x}{\sqrt{u}}\,\frac{du}{2x} = \int 2u^{-1/2}\,du$$

$$= \frac{2u^{1/2}}{1/2} + C = 4u^{1/2} + C$$

$$= \boxed{4\sqrt{x^2+1} + C}$$