MATHEMATICS 101 Section 201
Quiz #1, January 16, 2012
Show all your work. Use back of page if necessary. Calculators are not allowed.

Last Name: **First Name:** **UBC Stud. No.:**

For reference, you may need some or all of the following formulas

$$\sum_{i=1}^{n} i = \frac{n(n+1)}{2} \qquad \sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6} \qquad \sum_{i=1}^{n} i^3 = \frac{n^2(n+1)^2}{4}$$

1) (5 marks) By evaluating the limit of Riemann sums obtained by using n equal-length subintervals and right endpoints (i.e. R_n), evaluate $\int_1^3 (x^2 + 3x)\, dx$. *No credit will be given for a solution that uses antidifferentiation.*

2) (3 marks) Evaluate

$$I = \int_{-2}^{0} (x+2)\, dx + \int_{0}^{2} \sqrt{4 - x^2}\, dx$$

by interpreting it in terms of areas. In other words, draw a picture (both integrals on one diagram) of the region the integrals represent, and find the area using high-school geometry. *No credit will be given for a solution that uses antidifferentiation.*

3) (2 marks) Suppose that $f(x)$ is continuous. Write the following integrals as a single integral of the form $\int_a^b f(x)\, dx$:

$$\int_{-4}^{2} f(x)\, dx + \int_{2}^{7} f(x)\, dx - \int_{-4}^{-1} f(x)\, dx$$