**King Fahd University of Petroleum and Minerals**
**Department of Mathematics and Statistics**

Semester (111)                                    January 02, 2012

Math 302
Quiz 6

Name:  ..................................................................

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**Exercise 1.** Use Cauchy Integral Formula to compute the contour integral

$$\oint_{\mathcal{C}} \frac{\cos(2iz^2)}{(z-2i)^3} \, \mathrm{d}z,$$

where $C$ is any positively oriented simple closed contour enclosing $2i$.

**Example 2.**

(1) Find the Laurent series of the function $f(z) = \dfrac{1}{1+z^2}$ in the annular domain $D$ given by: $0 < |z - i| < 2$.

(2) Evaluate the contour integral

$$I = \oint_{\mathcal{C}} f(z) \, \mathrm{d}z,$$

where $\mathcal{C}$ is the positively oriented circle $|z - i| = 1$.