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MATH 4103   Quiz 7   Spring 2016

Name: _____

Problem 1. **[1+1+1 points]** Let the contour C in $\mathbb{C}$ be given by the parametric equation

$$Z(t) = 1 + 2it , \qquad t \text{ goes from } 0 \text{ to } 1 \qquad (1)$$

and let the function $f : \mathbb{C} \to \mathbb{C}$ be given by

$$f(z) = z . \qquad (2)$$

(a) Draw the contour C given by (1) in the complex plane $\mathbb{C}$. In your picture, indicate the initial point and the final point of C, and put an arrow on C to indicate the direction in which it is traversed.

(b) For the contour C given by (1) and the function f given by (2), compute the contour integral by using the formula

$$\int_C f(z)\,\mathrm{d}z := \int_a^b f(Z(t))\,Z'(t)\,\mathrm{d}t .$$

(c) For C and f given by (1) and (2), compute the integral $\int_C f(z)\,\mathrm{d}z$ in a different way (without using the parameterization of C).