Name: _____

Date: _____

Collaborators: _____

Question:	1	2	3	Total
Points:	20	20	20	60
Score:				

Instructor/grader comments:

Method of residues

1. (20 points) Calculate the integral:

$$I = \int_0^\infty \frac{\cos(2x)}{1+x^4}\,\mathrm{d}x.$$

Sketch the integration contour. Indicate the position(s) of the pole(s) of the integrand. Compare your answer with the result produced by a computer algebra system.

2. (20 points) Calculate the integral:

$$I = \int_0^\infty \frac{\mathrm{d}x}{1+x^3}.$$

Use the integration contour shown in Fig. 1. Compare your answer with the result produced by a computer algebra system.

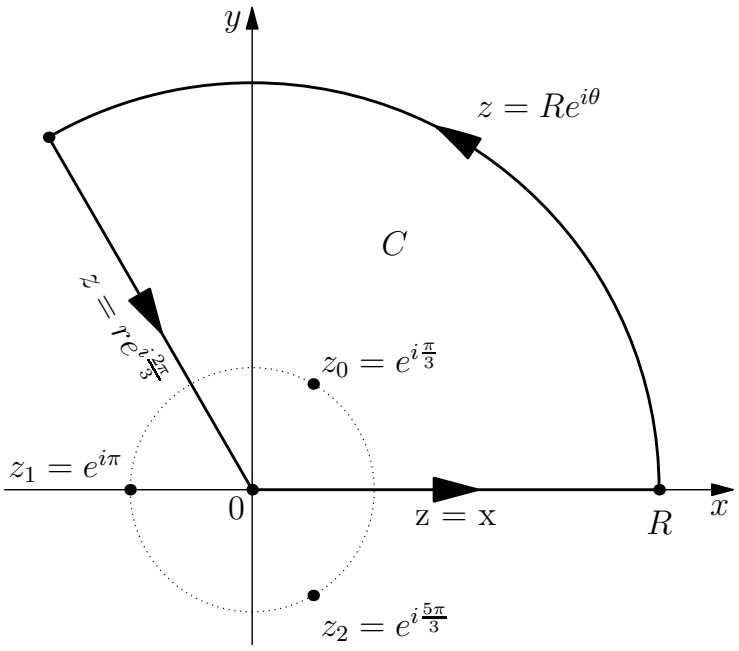

Figure 1: Integration contour for Problem 2.

3. (20 points) Calculate the integral:

$$I = \int_0^\infty \frac{\mathrm{d}x}{(1+x^2)^2}.$$

Sketch the integration contour. Indicate the position(s) of the pole(s) of the integrand. Compare your answer with the result produced by a computer algebra system.