QUIZ 6 - MATH 152 YOUR NAME:

Read each problem **very carefully** before starting to solve it. Each problem is worth 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Find the general solution of the differential equation

$$\frac{\mathrm{d}y}{\mathrm{d}x} = -\frac{y^2 \sin x}{1+y^4}.$$

Then find its particular solution under the initial condition y(0) = 1.

2. In a test tube of volume 1000 cubic inches, there is initially air containing 10% carbon dioxide. Fresher air with only 1% carbon dioxide flows into the tube at a rate of 1 cubic inch per second, while the mixed air flows out of the tube at the same rate. What is the volume of the carbon dioxide that remains in the tube at time t (in seconds) after the process begins?