Show your work   February 28, 2011   Name _____
   Good Luck!   Quiz #5 C   please print

1. R is the region between the $f(x) = \dfrac{10}{1+x^2}$ and $g(x) = x$ for $0 \le x \le 2$.

   Write a definite integral for the volume when R is rotated around

   (a) the y-axis: (b) around the line x=3
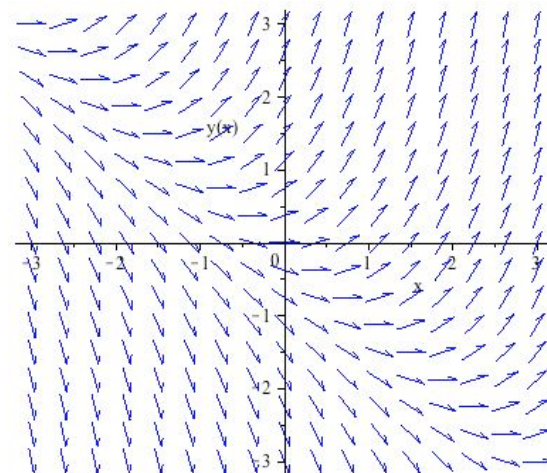
   $$V = \int$$ $$V = \int$$

(2)(2)

2. The figure shows the direction field for a differential equation.

   (a) Sketch the solution that goes through the point (-1 , 0).

   (b) Sketch the solution with the initial value condition y(0)= 1.

(2)(2)

3. Solve $\dfrac{dy}{dx} = 6x + 8e^{2x} + \sin(x)$ $y(0) = 15$

   y = _____

(4)

4. Solve $\dfrac{dy}{dx} = \dfrac{6x^2 + \dfrac{1}{x}}{e^y}$ $y(1) = 0$ y = _____

(5)

5. The population at time t years is $P(t) = 200e^{0.3t}$ so $P(0) = 200$.

   How long will it take for the population to **triple**? _____

(2)

6. (a) Solve $\dfrac{dy}{dx} = 3y$ *and* $y(0) = 5$.   (b) Solve $\dfrac{dy}{dx} = Ay$ *and* $y(0) = C$

(1)(1)

       y = _____   y = _____