Name_____

Student I.D._____

Math 1210-1
Quiz 8
April, 2016

Directions: You may ask and answer each others questions on this quiz. The goal is to understand what you're doing and express your thoughts clearly. Write your own solutions though, rather than just copying someone elses. Calculators are not allowed on this quiz. Show your work.

1) Find the following antiderivatives.

a) ~~(3 points)~~ (5 pts)

$$\int x^4 - \frac{5}{x^2} + 2\sqrt{x}\,dx = \int x^4 - 5x^{-2} + 2x^{1/2}\,dx$$

$$= \frac{x^5}{5} - 5\frac{x^{-1}}{-1} + 2\frac{x^{3/2}}{3/2} + C$$

$$\boxed{= \frac{x^5}{5} + 5x^{-1} + \frac{4}{3}x^{3/2} + C}$$

b) ~~(4 points)~~ (5 pts)

$$\int \frac{6t}{(t^2+5)^2}\,dt$$

$u = t^2 + 5$

$du = 2t\,dt$

$\Rightarrow 3\,du = 6t\,dt$

$$= \int 3\frac{du}{u^2} = 3\int u^{-2}\,du = 3\frac{u^{-1}}{-1} + C$$

$$\boxed{= \frac{-3}{t^2+5} + C}$$

check!

$D_t\, -3(t^2+5)^{-1}$

$= -3(-1)(t^2+5)^{-2}\cdot$

$= \frac{6t}{(t^2+5)^2}$ ✓

2) ~~(3 points)~~ Solve the differential equation initial value problem for $y(x)$

no pts because we didn't have much time

$$\frac{dy}{dx} = \sin(x)$$
$$y(0) = 2.$$

$$\int \sin x\,dx = -\cos x + C$$

$y = -\cos x + C$

$y(0) = 2 = -1 + C \Rightarrow C = 3$

$$\boxed{y = -\cos x + 3}$$