MAC 2313 (Multivariable Calculus) — Answers
QUIZ 9, Friday October 28, 2016

Name: **PID:**

Remember that no documents or calculators, or any other electronic devices are allowed during the quiz. Also remember that you won't get any credit(s) if you do not show the steps to your answers.

1. [3] Evaluate the double integral: $\int_1^4 \int_0^1 \frac{2x+y^2}{y^2+1}\,dxdy = \int_1^4 \frac{1}{y^2+1}\left[x^2+xy^2\right]_0^1 dy$

$= \int_1^4 \frac{1+y^2}{1+y^2}\,dy = \int_1^4 dy = y\Big]_1^4 = 4-1=3$

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2. [3] Reverse the order of integration in the following integral (Sketch the region or use inequalities):

$\int_0^1 \int_{x^3}^{x^2} f(x,y)\,dydx = \int_0^1 \int_{\sqrt{y}}^{\sqrt[3]{y}} f(x,y)\,dxdy$

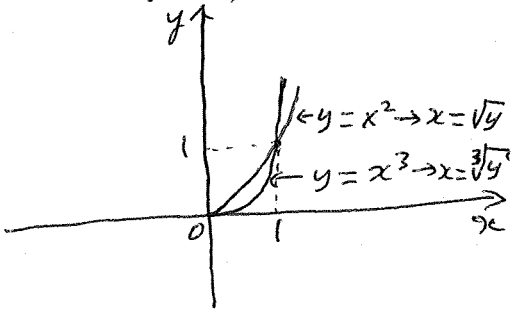
$0 \le x \le 1$

$0 \le x^3 \le y \le x^2 \le 1$

$x \le \sqrt[3]{y} \quad \sqrt{y} \le x$

$\sqrt{y} \le x \le \sqrt[3]{y}$

$0 \le y \le 1$



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3. [4] Convert the following integral to polar coordinates, but do not evaluate any of those integrals. You must sketch the region R involved.

$\int_{-2}^{2} \int_0^{\sqrt{4-x^2}} e^{-\sqrt{x^2+y^2}}\,dydx = \int_0^{\pi} \int_0^2 e^{-r}\,r\,dr\,d\theta$

$x = r\cos\theta$

$y = r\sin\theta$

$r = \sqrt{x^2+y^2}$

$0 \le r \le 2$

$0 \le \theta \le \pi$