

NAME:

QUIZ 7 FOR MATH 2551 F1-F4, OCTOBER 24, 2018

This quiz should be taken without any notes and calculators. Time: 20 minutes. Show your work, otherwise credit cannot be given.

Problem 1: (3 points) Evaluate the double integral over the given region R :

$$\int_R \int (6y^2 - 2x) dA, \quad R: 0 \leq x \leq 1, 0 \leq y \leq 2.$$

Have to evaluate

$$\begin{aligned} \int_0^2 \int_0^1 (6y^2 - 2x) dx dy &= \int_0^2 (6y^2 x - x^2) \Big|_0^1 dy \\ &= \int_0^2 (6y^2 - 1) dy = (2y^3 - y) \Big|_0^2 = 14 \end{aligned}$$

Problem 2: (4 points) For the integral below write an equivalent integral with the order of integration reversed:

$$\int_0^1 \int_2^{4-2x} dy dx$$

(Hint: Sketch the region of integration.)

The integral in reverse order of integration is given by

$$\int_2^4 \int_0^{2-\frac{y}{2}} dx dy$$

Problem 3: (3 points) Find the volume of the prism whose base in the xy plane is bounded by the x -axis and the lines $y = x$ and $x = 1$ and whose top lies in the plane $z = 1 + x + y$.

We integrate

$$\int_0^1 \int_0^x (1 + x + y) dy = \int_0^1 (y + xy + \frac{y^2}{2}) \Big|_0^x dx = \int_0^1 (x + \frac{3}{2}x^2) dx = 1$$