Math 32B - Fall 2019
Practice Exam 1

Full Name: _____

UID: _____

Circle the name of your TA and the day of your discussion:

Steven Gagniere   Jason Snyder   Ryan Wilkinson

Tuesday   Thursday

Instructions:

- Read each problem carefully.

- Show all work clearly and circle or box your final answer where appropriate.

- Justify your answers. A correct final answer without valid reasoning will not receive credit.

- Simplify your answers as much as possible.

- Include units with your answer where applicable.

- Calculators are not allowed but you may have a 3×5 inch notecard.

Page	Points	Score
1	20	
2	20	
3	15	
4	20	
5	25	
Total:	100	

1. (10 points) Evaluate the iterated integral.

$$\int_0^4 \int_{\sqrt{y}}^2 \sqrt{x^3 + 1}\, dx\, dy$$

2. (10 points) Evaluate the iterated integral.

$$\int_0^3 \int_0^{\sqrt{9-x^2}} e^{x^2+y^2}\, dy\, dx$$

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3. (10 points) Find the volume of the solid enclosed by $z = 0$, $y = z$, and $x^2 + y^2 = 4$.

4. (10 points) Use a triple integral to find the volume of the solid enclosed by $y = x^2$, $z = 3y$, and $z = 2 + y$.

/20

5. (15 points) Consider the tetrahedron bounded by the coordinate planes and the plane $x + y + z = 1$ with density function $\delta(x, y, z) = 12y$.

  1. Find the mass of the tetrahedron.

  2. Set up but **DO NOT EVALUATE** the integrals used to find the center of mass of the tetrahedron.

6. (20 points) Evaluate the triple integral $\iiint_E x^2 \, dV$ where E is the solid above $z = 0$ and inside $4x^2 + 9y^2 + z^2 = 36$.

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7. (10 points) Find the area inside one petal of the polar rose $r = \sin(2\theta)$.

8. (15 points) Use a change of variables to evaluate $\iint_{\mathcal{D}} x\, dA$ where $\mathcal{D}$ is the region in the first quadrant bounded by $y = 0$, $y = 4$, $y = x^2$, and $y = x^2 - 4$.

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