Exam #3

ⓘ This is a preview of the published version of the quiz

Started: Dec 5 at 8:23pm

Quiz Instructions

Exam #3

Exam #3

The following is Exam #3. You will have until 3:15 PM to complete this exam. The due time for the exam may be extended, so please do not stress if you are not finished and 3:15 PM approaches.

Please complete this exam on separate paper or on a tablet. Clearly indicate the question number for each question. Please show all work and clearly indicate your answers. Remember, this exam is an opportunity for you to demonstrate what you know. Please work on this exam on your own. You are not allowed to use your textbook, collaborate, nor allowed to use any external websites for assistance. You may use a calculator on this exam. Once you complete this exam, please submit a pdf of your exam to Canvas.

Once you complete the exam, please click on "Submit". You will not submit the exam to this assignment. You will submit your exam through the "**Exam #3 Submission Assignment**" in Canvas under **Assignments**. You can use a device to scan your exam. Please note that once your click Submit on this part of the exam and use your phone, you may not continue to work on your exam. If using paper, scan in your exam using Adobe Scan or any other scanning app.

You may only submit your exam once through the submission assignment. Submission times may be checked with when you log off Zoom and/or when you submit this part of the exam.

For this exam, you must keep your camera on for proctoring purposes. You will be placed into an individual breakout room. If you have any questions during the exam, you can click on the "Ask for Help" button and I will be with you as soon as possible.

(7 points) 1. Find three positive numbers whose sum is 100 and whose product is a maximum.

(7 points) 2. Use Lagrange multipliers to determine the maximum and minimum values of $f(x, y, z) = 2x + 2y + z$ subject to the constraint $g(x, y, z) = x^2 + y^2 + z^2 = 9$.

(5 points) 3. Estimate $\int\int_R (2x^2y + 3y^2)\, dA$ where $R = [0, 1] \times [0, 1]$ by dividing R into four equal squares and evaluating the function at the upper right corner of each square.

(7 points) 4. Find the volume under the surface $z = x^2$ and above the region in the xy-plane enclosed by the parabola $y = 2 - x^2$ and the line $y = x$.

(7 points) 5. Find the average value of the function $f(x, y) = xy^2$ over the region bounded by the lines $x = 2$ and $y = 3$ in the first quadrant.

(7 points) 6. Use a double integral to find the volume of the solid region under the paraboloid $z = x^2 + y^2$ and above the disk $x^2 + y^2 \leq 36$.

(7 points) 7. Sketch the region of integration, reverse the limits of integration, and then integrate: $\int_0^1 \int_{\sqrt{x}}^1 \sqrt{y^3 + 1}\, dy\, dx$

(7 points) 8. Use a double integral to find the area inside one leaf of $r = 4\cos 2\theta$.

(7 points) 9. Use a triple integral to find the volume of the tetrahedron enclosed by the coordinate planes and the plane $4x + 3y + z = 12$.

(7 points) 10. Use cylindrical coordinates to evaluate $\int\int\int_E z\, dV$ where E is the solid enclosed by the paraboloid $z = x^2 + y^2$ and the plane $z = 4$.

(7 points) 11. Use spherical coordinates to evaluate $\int\int\int_E y^2 z^2\, dV$, where E is the solid that lies above the cone $z = \sqrt{x^2 + y^2}$ and below the sphere $x^2 + y^2 + z^2 = 1$.

Not saved Submit Quiz