Quiz 3

Be sure to follow the quiz instructions in order to avoid a deduction in points. Submissions are due in Gradescope by 11:59pm on Friday; no late work is accepted.

Name:

Question #1: Find the average height of the paraboloid $z = x^2 + y^2$ over the rectangle $R = [0, 2] \times [0, 4]$.   [AJN]

Question #2: The integral below gives the area of a region R in the xy-plane. Sketch the region R, labeling each boundary curve with its equation, as well as providing labels for the axes, as well as the x-intercepts, y-intercepts, and the points of intersection of the boundary curves. Then, find the area of the region R. [AJN]

$$\int_{-2}^{3} \int_{y^2}^{y+6} dx\, dy$$
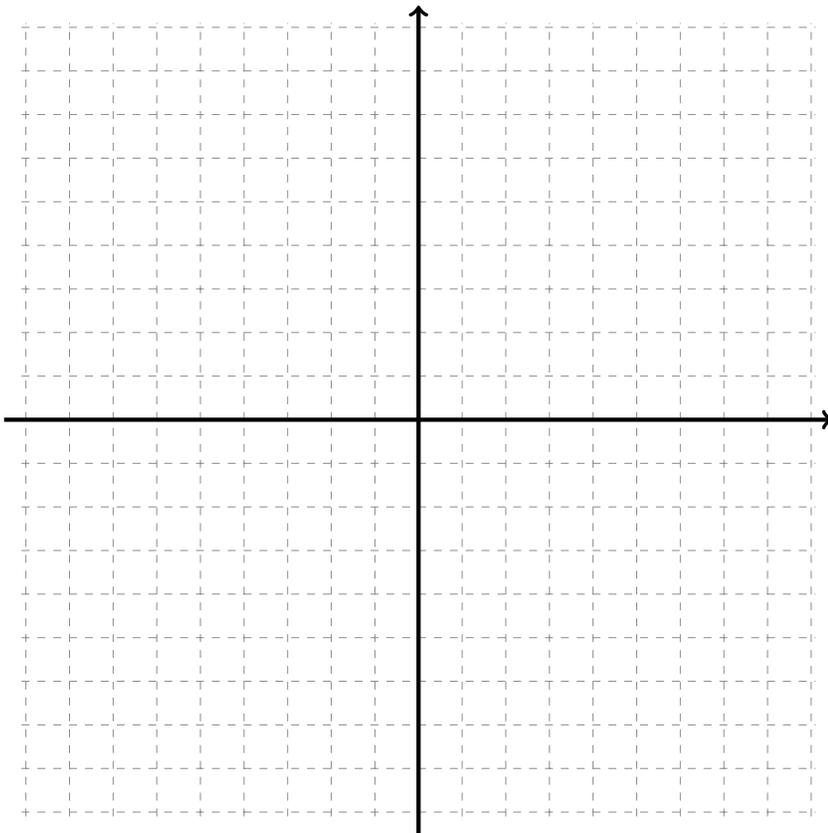
Question #3: Let R be the region in the first quadrant that lies inside the circle $x^2 + y^2 = 9$ and above the line $y = 3 - x$, and suppose $f(x, y) = x$. Sketch the region R on the axes provided, and make sure to label the axes, each boundary curve, and the intercepts of the boundary curves in your sketch. Then, find the value of $\iint_R f(x, y)\, dA$.   [AJN]