Name: _____ **Score:** _____
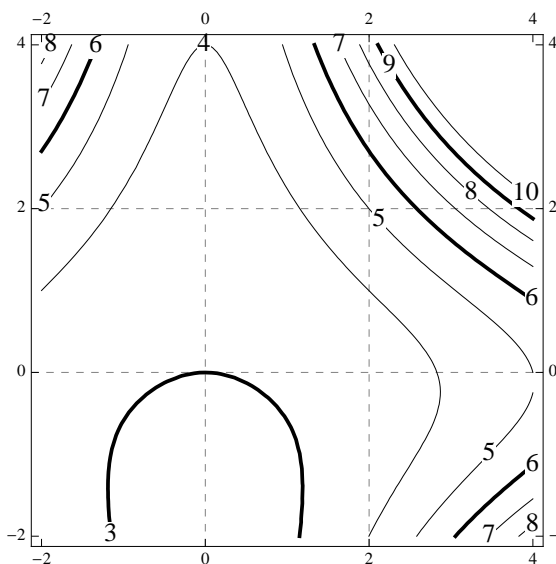
Directions. Show your work and write complete solutions or you may not receive credit. If you need more room, use the backs of the pages and indicate to the reader that you have done so.

1. The contour graph of a function $f(x, y)$ is shown below. Use the midpoint method to estimate the average value of f on the region $-2 \leq x \leq 4$, $-2 \leq y \leq 4$. Remember to show your work.

2. Compute $\iint_R y \cos(xy) \, dA$, where R is the rectangle $[0, 3] \times [0, \pi]$.

3. Calculate $\displaystyle\iint_R 2x\,dA$, where R is the shaded region shown below.

$$y = x^2$$