TEST 2

This test has been modified: the original was based on a different syllabus.

1. Find the points of intersection of \( y = 2x - x^2 \) and \( y = x - 2 \). Set up and evaluate an integral that represents the area between the graphs.

2. The region bounded by \( y = 9 - x^2 \), \( y = 0 \), and \( x = 0 \) is revolved about the \( x \)-axis. Set up and evaluate an integral that represents the volume of the resulting solid.

3. The region bounded by \( y = x^2 + 1 \), \( y = x \), \( x = 0 \), and \( x = 2 \) is revolved about the \( x \)-axis. Find the volume of the resulting solid.

4. The region bounded by \( y = e^x \), \( y = 1 \) and \( x = \ln 2 \) is revolved about the line \( x = \ln 2 \). Set up but do not evaluate an integral that represents the volume of the resulting solid.

5. Find the arc length of the curve \( y = \frac{x^2}{3} \), \( 0 \leq x \leq 1 \).

6. Evaluate \( \int e^x \cos x \, dx \).

7. Evaluate the integral a) \( \int_1^{e^2} \ln t \, dt \) b) \( \int_1^{e^2} (\ln t)^2 \, dt \).