

QUIZ ONE

Name _____ Difficulty (increasing): 1 2 3 4 5

1. Solve the initial value problem below. (3 pts)

$$\frac{dy}{dx} = e^{-x-y-2}, \quad y(0) = -2$$

2. Which one of the following integrals corresponds to the area of the region bounded by $y = x^2$ and $y = x + 2$ from $x = 0$ to $x = 4$? (Show your work to receive full credit) (3 pts)

(a) $\int_0^4 x^2 - (x + 2)dx$

(c) $\int_0^2 x^2 - (x + 2)dx + \int_2^4 (x + 2) - x^2dx$

(b) $\int_0^4 (x + 2) - x^2dx$

(d) $\int_0^2 (x + 2) - x^2dx + \int_2^4 x^2 - (x + 2)dx$

3. Does $\cosh x$ grow faster, slower, or at the same rate as e^x as $x \rightarrow \infty$? Give reasons for your answer. (3 pts)
4. Find the volume of the solid that lies between planes perpendicular to the x-axis at $x = -1$ and $x = 1$. The cross-sections perpendicular to the x-axis are triangles whose bases run from the semicircle $y = -\sqrt{1 - x^2}$ to the semicircle $y = \sqrt{1 - x^2}$. The height of each triangle is half the length of its base. (6 pts)

5. Set up an integral to find the volume of the solid generated by revolving the region bounded by $x = -3$, $x = 1$, $y = 0$, and the parabola $y = x^2 + 1$ about the x -axis. Sketch a graph and label any important parts. Simplify but **do not evaluate the integral**. (5 pts)