

Answer ALL questions. Unless instructed otherwise, you should show ALL your work and simplify your final answer as much as possible. Please box your final answer to each part.

Problem 1: [8 pts] Find the following indefinite integral

$$\int \frac{9}{x^2 \sqrt{9 + 4x^2}} dx$$

Problem 2: [9 pts] Find the area of the region bounded by the curves $y = \arctan x$ and $y = x \arctan x$.

Problem 3: [8 pts] The unbounded region R is bounded above by the curve $y = \frac{1}{\sqrt{x^2+3x+2}}$, below by the x -axis and to the left by $x = 0$. This region R is rotated about the x -axis. Is the volume of the resulting solid finite or infinite? If it is finite, evaluate it.