You must show all relevant work to receive full credit. The point value of each problem is shown in the left hand margin.

(3) 1. Integrate:

\[
\int \frac{1}{4x^2 + 4x + 5} \, dx
\]

(3) 2. Is the area under the curve \( y = \frac{1}{x} \) from 1 to \( \infty \) finite or not. Justify your answer.

(2) 3. Find the cartesian coordinates of the point with polar coordinates \((-2, \frac{\pi}{2})\).

(2) 4. Write the polar equation \( r = \sin \theta \) in cartesian coordinates.