Problem 3: Does the Limit Exist?

Determine whether the following limit exists or not. If it does, find its value.

$$\lim_{x \to -\infty} \frac{1}{x} \cdot \int_x^{-\pi} (t + \sqrt{t^2 + 2t})\,dt$$

As always, show your work, fully explain and justify your answer.