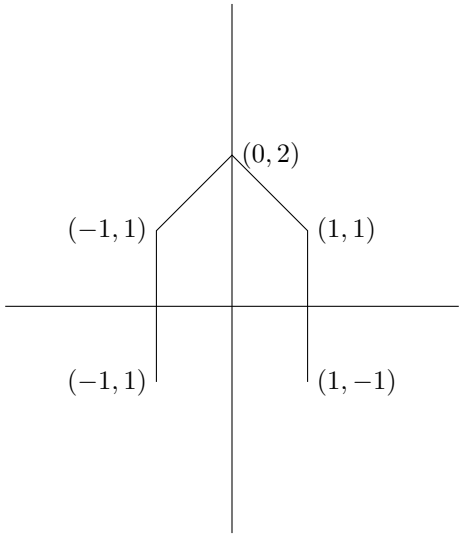
Find the Potential

Find the potential of the vector field $\langle 1 + e^{x+y}, 1 + e^{x+y} \rangle$. Then compute the integral of this vector field over curve given by $\langle t^2 + t + \sqrt{t}, t - 2t^3 \rangle$ where t goes between 0 and 1.

Applying Green's Theorem

Compute the line integral of the vector field $\langle -y + x^3, x + y \rangle$ over the following curve starting at $(1, -1)$ and ending at $(-1, -1)$. *Hint: You can close up the curve to bound a region by adding in another curve from* $(-1, -1)$ *to* $(1, -1)$.



Applying Green's Theorem II

Compute $\iint_R 2x dA$ over the shaded region below. Notice that $2x = \text{curl}\langle 0, x^2 \rangle$.