NAME:

Worksheet Week V

(a) Let C denote the semicircular path

$$z = 2e^{i\theta} \qquad (0 \leq \theta \leq \pi/2).$$

Sketch the path and determine its endpoints z_0 and z_1.

(b) Compute the contour integral

$$\int_C z^{1/2} dz,$$

where $z^{1/2}$ denotes the principal value.

(c) Without evaluating, show that

$$\left| \int_C \frac{z+4}{z^3-1} \right| \leq \frac{6\pi}{7},$$

where C is the arc of the circle $|z| = 2$ from 2 to $2i$.