

Note 2 Q1(c) Essentially you are applying Thm 4.2

So you need to set up the solution in the format of this theorem.

$Q(z) = \frac{1}{16z^2 - 1}$  is even and analytic on  $\mathbb{C}$  except for simple poles at  $\pm \frac{1}{4}$ .

Note 3: First, you need to state clearly that you are using the Estimation Thm.

For  $z \in S_N$ , then  $|z| \geq N + \frac{1}{2}$

so by the Estimation Thm and Lemma 4.2

$$\left| \int_{S_N} f(z) dz \right| \leq \frac{\pi}{16(N + \frac{1}{2})^2 - 1} \cdot 4(2N + 1) \rightarrow 0 \text{ as } N \rightarrow \infty$$