

Panel 1

Complex HW - the least (Hopefully)

Let $f(z) = \frac{1}{1+z^6}$.

- a) Find and classify all singularities of f
- b) Find the residues of those singularities in the upper half plane (Hint: l'Hospital's rule)

c) Evaluate $\int_{-\infty}^{\infty} \frac{1}{1+x^6} dx$

If no, why not?
You do not need
to find the actual

- d) Would the same techniques work to evaluate

$$\int_{-\infty}^{\infty} \frac{x^2}{1+x^4} dx, \quad \int_{-\infty}^{\infty} \frac{x^3}{1+x^4} dx, \quad \int_{-\infty}^{\infty} \frac{1}{1+x^3} dx$$

answer,
just yes
or no