



Worksheet 8

Fri, Mar 22

Spring 2019

Roll# Student 1:

Roll# Evaluator 1:

Roll# Student 2:

Roll# Evaluator 2:

Problem 1 [30 minutes]

Evaluate the following integrals using either Cauchy's integral theorem or Cauchy's integral formulas, where the closed contours γ are traversed anticlockwise.

(a) $\oint_{\gamma} \frac{z^3 - 3}{z - i} dz$ $\gamma : |z - i| = \frac{1}{2}$

(d) $\oint_{\gamma} \frac{z^3 - 3}{z(z - i)} dz$ $\gamma : |z - i| = 2$

(b) $\oint_{\gamma} \frac{z^3 - 3}{z} dz$ $\gamma : |z - i| = \frac{1}{2}$

(e) $\oint_{\gamma} \frac{z^3 - 3}{z(z - i)^3} dz$ $\gamma : |z - i| = \frac{1}{2}$

(c) $\oint_{\gamma} \frac{z^3 - 3}{z(z - i)} dz$ $\gamma : |z - i| = \frac{1}{2}$

(f) $\oint_{\gamma} \frac{e^{-2z}}{z(z - i)^3} dz$ $\gamma : |z - i| = \frac{1}{2}$

Problem 2 [15 minutes]

Solve the following using Cauchy's residue theorem.

(a) $\oint_{\gamma} \frac{z^3 - 3}{z(z - i)} dz$ $\gamma : |z - i| = 2$

(c) $\oint_{\gamma} \frac{\cos z}{z(z - \frac{\pi}{2})} dz$ $\gamma : |z - i| = 2$

(b) $\oint_{\gamma} \frac{z^3 - 3}{z(z - i)^3} dz$ $\gamma : |z - i| = 2$

(d) $\oint_{\gamma} \frac{\sin z}{z(z - \frac{\pi}{2})} dz$ $\gamma : |z - i| = 2$