Panel 1

Complex HW #14

① Show that for every path γ from z_1 to z_2 we have:

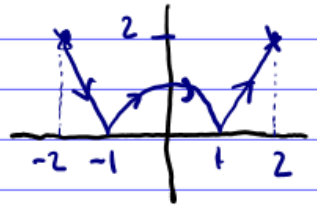
$$\int_\gamma z^n\,dz = \frac{1}{n+1}\left(z_2^{n+1} - z_1^{n+1}\right), \quad n = 0, 1, 2, \ldots$$

② Explain why each integral is well-defined and evaluate:

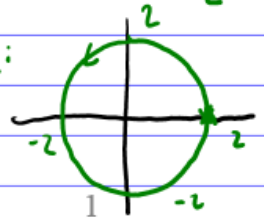
(a) $\displaystyle\int_i^{i/2} e^{\pi z}\,dz$ (b) $\displaystyle\int_0^{\pi+2i} \cos\left(\tfrac{z}{2}\right)dz$ (c) $\displaystyle\int_1^3 (z-2)^3\,dz$

③ Evaluate (a) $\displaystyle\int_{C_1} z^2 + 3z\,dz$ (b) $\displaystyle\int_{C_2} \cos(z^2)e^z\,dz$ (c) $\displaystyle\int_{C_3} \frac{3}{z}\,dz$

C_1



C_2:



C_3: