ASSIGNMENT

1. $\int_C \operatorname{Im} z^2 dz$, C is the path around the triangle with vertices $0, 2i, 1+2i$ (counter clockwise).
2. . $\int_C f(z)dz$, where $f(z) = 2x + y - 2xi$ along C
   (a) C is shortest path from $z = 0$ to $z = i + 1$.
   (b) consists of two line segments, one from $z = 0$ to $z = i$ and other from $z = i$ to $z = i + 1$.
3. $\int_C$ Re $z^2\, dz$, C is the boundary of the square with vertices $0, \mathrm{i}, 1 + \mathrm{i}, 1$ clockwise.
4. Sketch the path C, where C consists of two line segments, one from $z = 0$ to z = 3 and other from $z = 3$ to $z = 3 + i$ and hence evaluate $\int_C \bar{z}\, dz$.
5. 13. $\int_C \left(\frac{1}{\mathrm{z+i}} - \frac{2}{(\mathrm{z+i})^2}\right) dz$, C is the circle $|z + i| = 2$, clockwise.
6. Evaluate $\oint_C \frac{e^{2\pi z}}{(z+i)^2} dz$, $C: |z + i| = 2$ using **Cauchy residue theorem**.
7. Expand $f(z) = \frac{z}{(z-3)(4-z)}$ in a Laurent series valid for $3 < |z| < 4$. Also sketch the ROC.
8. Determine inverse Z-transform of $X(z) = \frac{2}{(1-z^{-1})(1-0.5z^{-1})}$, $|z| > 1$.