BRAC University
MAT-215
Exercise Sheet # 4 (PART B)

(Cauchy's Integral Formula)

1. Evaluate $(a)\oint_C \frac{\sin \pi z^2 + \cos \pi z^2}{(z-1)(z-2)}\,dz$ $(b)\oint_C \frac{e^{2z}}{(z+1)^4}\,dz$

   where C is the circle $|z| = 3$.

2. Evaluate $\oint_C \frac{e^z}{(z^2+\pi^2)^2}\,dz$

   where C is the circle $|z| = 4$.

3. Evaluate $\oint_C \frac{e^{3z}}{z-\pi i}\,dz$

   where C is the circle $|z-1| = 4$.

4. Evaluate $\frac{1}{2\pi i}\oint_C \frac{e^{zt}}{(z^2+1)^2}\,dz$ if $t > 0$ and C is the circle $|z| = 3$.

5. Evaluate $\oint_C \frac{dz}{z-2}$ around the circle $|z-1| = 9$.