Quiz # 2

Q1 Determine the Poles and the residue at each Pole of the function.

$$f(z) = \frac{z^2}{(z-1)^2(z+2)}.$$

Q2 Evaluate $\int_C \frac{z}{z^2+1}\,dz$ where

(i) C is $|z + 1/z| = 2$

(ii) C is $|z+i| = 1$

Q3 Find Laurent's expansion of the function

$$f(z) = \frac{7z-2}{(z+1)(z+2)}$$ in the region $1 < |z+1| < 3$.

Q4 Find the Fourier Series of the function

$$f(x) = \begin{cases} -1 & \text{for } -\pi < x < -\pi/2 \\ 0 & \text{for } -\pi/2 < x < \pi/2 \\ 1 & \text{for } \pi/2 < x < \pi \end{cases}.$$