STA457H1: Time Series Analysis

Assignment 3 - Question 1 **Due data December 2, 2022**

Student Name...ID number...

Instructions: *Show your answers in details.*

Q1 (5 points): Find the autocorrelation function (ACF) of the following ARMA models

1. AR(1) model: $z_t = 0.7z_{t-1} + w_t$, where $w_t \sim \text{wn}(0, \sigma_w^2)$.
2. AR(2) model: $z_t = 0.1z_{t-1} + 0.3z_{t-2} + w_t$, where $w_t \sim \text{wn}(0, \sigma_w^2)$.
3. MA(1) model: $z_t = w_t - 0.5w_{t-1}$, where $w_t \sim \text{wn}(0, \sigma_w^2)$.
4. MA(2) model: $z_t = w_t - 1.1w_{t-1} + 0.28w_{t-2}$, where $w_t \sim \text{wn}(0, \sigma_w^2)$.
5. ARMA$(1, 1)$ model: $z_t = 0.3z_{t-1} + w_t + 0.7w_{t-1}$, where $w_t \sim \text{wn}(0, \sigma_w^2)$.