MATH304   HW 12

due **Dec 1** before class, **answer without justification will receive 0 points**. The typing the HW in LATEX is optional.

1:   Solve the recurrence relation

$$h_n = 3h_{n-2} - 2h_{n-3}$$

with initial values $h_0 = 1$, $h_1 = 0$, and $h_2 = 0$ using characteristic equation. Verify your answer for h_3.

2:   Solve the recurrence relation

$$h_n = 3h_{n-2} - 2h_{n-3}$$

with initial values $h_0 = 1$, $h_1 = 0$, and $h_2 = 0$ using generating functions.

3:   Solve the recurrence relation

$$h_n = 3h_{n-1} + n^2 - 3$$

with initial value $h_0 = 1$ using characteristic equation. Verify your answer for h_1.

4:   Solve the recurrence relation

$$h_n = 3h_{n-1} + n^2 - 3$$

with initial value $h_0 = 1$ using generating functions.

5:   Solve the recurrence relation

$$h_n = 2h_{n-1} + 2^n$$

with initial value $h_0 = 1$ using generating functions. Verify your answer for h_1.

6:   Let
$$g(x) = \frac{x^2 - 3x + 1}{4x^3 - x^2 - 2x + 1}$$
be a generating function for a sequence $h_0, h_1, h_2, \ldots, h_n, \ldots$. Find a linear homogeneous recurrence relation for the sequence and include also the initial values.