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DISCRETE MATHEMATICS (DBM2033)
Session December 2017
SELF-EXERCISE 12

Instructions

- Answer ALL questions. Write your answers in the spaces provided.
- Show your working. You may use a non-programmable scientific calculator.

1. Let P(n) be the statement

$$1 + 2 + 3 + 4 + \ldots + n = \frac{n(n+1)}{2}$$

   (a) What is the statement P(0)?
   (b) Show that P(1) is true.
   (c) Complete the inductive step.

2. A recurrence relation is given as $a_n = a_{n-2} + a_{n-1}$ where $n \geq 2, a_0 = 7$ and $a_1 = 13$, find a_2, a_3, a_4 and a_5.

3. Function f is defined recursively by $f(0) = 1$ and $f(n+1) = 2f(n) - f(n)^2 - 2$ for $n \geq 0$. Find $f(3)+f(4)$.