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| Mathematics Department | |  |
| Course: ATMAA | |
| Topic Title: Growth & Decay in Sequences  Test 1 | |
| Student Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Date: \_\_\_\_\_\_\_\_\_\_\_\_ | | |
| Special Instructions: Calculator Free  **Formula Sheet Allowed** | Time Allowed: 40 mins | | |
|  | Marks: / 35 | | |

**Question 1. (2, 2, 1: 5 marks)**

Consider the sequence: 18 25 32 39 46 . . . .

Find the :

a) recursive rule for this sequence.

b) rule for the term of this sequence.

c) 50th term of this sequence.

**Question 2. (1, 1, 1: 3 marks)**

Find the first 5 terms of the sequences given by the following recursive definitions.

a)

b)

c)

**Question 3. (2, 2: 4 marks)**

Consider the sequence: 5 15 45 135 405 . . . .

a) Find the recursive rule for this sequence.

b) Given the term is find and .

**Question 4. (1, 1, 1: 3 marks)**

For each of the following first order recurrence relations determine if they have a long term:

(i) increasing

(ii) decreasing or

(iii) steady state solution

(a)

(b)

(c)

**Question 5. (5, 2: 7 marks)**

The eighth term and twelfth term of an arithmetic sequence are 24 and 40 respectively.

a) Find the recursive rule for the sequence.

b) Find the fifth term

**Question 6. (2, 2: 4 marks)**

The term of a geometric sequence is described by the rule , where 1, 2, 3, 4, 5 . . . .

a) Find the first 5 terms of the sequence.

b) State the recursive rule for this sequence.

**Question 7. (3, 3, 3: 9 marks)**

A wedding photographer is quoting the following price for producing a wedding album for the newlyweds:

A fixed minimum cost of $150, with 80 photos in a hard-backed album. Further photos may also be added in lots of 10 photos at $0.70 per photo, up to a maximum of 200 photos.

He wants to set up a table below, showing:

• the type of album where *T1* is the basic album, with 80 photos at a cost of $150

• the number of photos in each of the possible album sizes

• the cost in dollars of each of the different albums.

a) Complete each of the blank cells of the table.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Type | T1 | T2 | T3 | T4 | T5 |  | Tn |
| Number of pictures | 80 |  |  |  |  |  | 200 |
| $ cost of album | $150 |  |  |  |  |  |  |

b) Write a rule that will calculate the number of pictures in album type = .

c) Write a rule that will calculate the cost of album type =