**Greenwood College**

Methods 1 & 2

Investigation Validation 1 (Number & Algebra) 2018

NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Marks:\_\_\_\_\_\_/61 = \_\_\_\_\_\_\_

**1. [4, 3, 4, 1 = 12 marks]**

a. Complete the difference table for a general cubic function.



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x | y | 1st difference | 2nd difference | 3rd difference |
| 0 | d |  |  |  |
|  |  |  |  |  |
| 1 |  |  |  |  |
|  |  |  |  |  |
| 2 |  |  |  |  |
|  |  |  |  |  |
| 3 |  |  |  |  |
|  |  |  |  |  |
| 4 |  |  |  |  |
|  |  |  |  |  |
| 5 |  |  |  |  |

b. Find a formula for the following:

i) Complete the table

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x | y | 1st diff | 2nd diff | 3rd diff |
| 0 | 0 |  |  |  |
|  |  |  |  |  |
| 1 | 1 |  |  |  |
|  |  |  |  |  |
| 2 | 14 |  |  |  |
|  |  |  |  |  |
| 3 | 51 |  |  |  |
|  |  |  |  |  |
| 4 | 124 |  |  |  |

ii. State the values of a, b, c, and d in the general cubic formula.

USE MUST USE ALGEBRAIC TECHNIQUES TO EARN MARKS.

c) Write the formula.

**2.** **[4, 4, 1 = 9 marks]**

Find a formula for the following cubic function:

a) Complete the table

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x | y | 1st diff | 2nd diff | 3rd diff |
| 0 | ? |  |  |  |
|  |  |  |  |  |
| 1 | 8 |  |  |  |
|  |  |  |  |  |
| 2 | 12 |  |  |  |
|  |  |  |  |  |
| 3 | 26 |  |  |  |
|  |  |  |  |  |
| 4 | 56 |  |  |  |

b) Find the values of a, b, c, and d in the general cubic formula.

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c) Write the formula.

**3.** **[4 marks]**

Fourth degree equations are called **quartic equations** and come in the form:



Complete the difference table for the general equation.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| x | y | 1st difference | 2nd difference | 3rd difference | 4th difference |
| 0 | **e** |  |  |  |  |
|  |  |  |  |  |  |
| 1 |  |  |  |  |  |
|  |  |  |  |  |  |
| 2 |  |  |  |  | **24a** |
|  |  |  |  |  |  |
| 3 |  |  |  |  |  |
|  |  |  |  |  |  |
| 4 |  |  |  |  |  |

**4. [6, 5, 1 = 12 marks]**



a. Complete the difference table.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| n | y | 1st diff | 2nd diff | 3rd diff | 4th diff |
| 0 | 0 |  |  |  |  |
|  |  |  |  |  |  |
| 1 | 0 + 1 = 1 |  |  |  |  |
|  |  |  |  |  |  |
| 2 | 0 + 1 + 8 = 9 |  |  |  |  |
|  |  |  |  |  |  |
| 3 |  |  |  |  |  |
|  |  |  |  |  |  |
| 4 |  |  |  |  |  |
|  |  |  |  |  |  |
| 5 |  |  |  |  |  |
|  |  |  |  |  |  |
| 6 |  |  |  |  |  |

b. Find a formula for **y in terms of n** by first stating the values of a, b, c, d, and e.

USE MUST USE ALGEBRAIC TECHNIQUES TO EARN MARKS

c. State the equation

**5. [6, 5, 1 = 12 marks]**

Find a formula for y in terms of n where



a. Complete the difference table.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| n | y | 1st diff | 2nd diff | 3rd diff | 4th diff |
| 0 |  |  |  |  |  |
|  |  |  |  |  |  |
| 1 |  |  |  |  |  |
|  |  |  |  |  |  |
| 2 |  |  |  |  |  |
|  |  |  |  |  |  |
| 3 |  |  |  |  |  |
|  |  |  |  |  |  |
| 4 |  |  |  |  |  |
|  |  |  |  |  |  |
| 5 |  |  |  |  |  |
|  |  |  |  |  |  |
| 6 |  |  |  |  |  |

b. State the values of a, b, c, d, and e

USE MUST USE ALGEBRAIC TECHNIQUES TO EARN MARKS

c. State the equation

**6. [6, 5, 1 = 12 marks]**

Find a formula for y in terms of n where



a. Complete the difference table.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| n | y | 1st diff | 2nd diff | 3rd diff | 4th diff |
| 0 |  |  |  |  |  |
|  |  |  |  |  |  |
| 1 |  |  |  |  |  |
|  |  |  |  |  |  |
| 2 |  |  |  |  |  |
|  |  |  |  |  |  |
| 3 |  |  |  |  |  |
|  |  |  |  |  |  |
| 4 |  |  |  |  |  |
|  |  |  |  |  |  |
| 5 |  |  |  |  |  |
|  |  |  |  |  |  |
| 6 |  |  |  |  |  |

b. State the values of a, b, c, d, and e

USE MUST USE ALGEBRAIC TECHNIQUES TO EARN MARKS

c. Write the equation.

**END OF VALIDATION**