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**FINAL REVIEW DAY 1**

Review of Arithmetic and Geometric Sequences

 Common Difference:

 Common Ratio:

Determine if the following sequences are arithmetic or geometric or neither:

1. 2, 4, 8, 16, 32, … 2) 0, 5, 10, 13, 24, …
2. 81, 27, 9, 3, 1, $\frac{1}{3}, $… 4) 27, 38, 49, 60, 71, …

Write the linear function for the following arithmetic sequences:

5)1, 3, 5, 7, 9, … 6) 5, 2, -1, -4, -7, …

7) 6, 10, 14, 18, …. 8) -3, -6, -9, -12, …..

Write the explicit formula for the following arithmetic sequences:

7) -37, -29, -21, -13, -5, … 8) 5, 25, 45, 65, 85, …

Write the exponential function for the following geometric sequences:

9) 2, 6, 18, 54, …. 10) 7, 14, 28, 56, ……

Write the explicit formula for the following geometric sequences:

11)5, -15, 45, -135, … 12) -6, -24, -72, -216, …

**WRITING QUADRATIC FUNCTIONS:** $f\left(x\right)= ax^{2}+bx+c$

**\*Remember:** When you are given a table, the **second difference must be constant**

in order to write a quadratic function.\*

**How to write a quadratic function:**

1. Find the second difference.
2. Make sure you have an initial term – VERY IMPORTANT!!
3. Find a, b, and c.
	1. 2a = second difference
	2. a+b = difference between the first and initial terms
	3. c = y-intercept
4. Write the function – f(x) = ax2 + bx + c.

Examples:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|  |  |
| --- | --- |
| 0 | 5 |
| 1 | 13 |
| 2 | 23 |
| 3 | 35 |
| 4 | 49 |

 |

|  |  |
| --- | --- |
| 1 | 8 |
| 2 | 16 |
| 3 | 28 |
| 4 | 44 |
| 5 | 64 |

 |

|  |  |
| --- | --- |
| 0 | 5 |
| 1 | 9 |
| 2 | 19 |
| 3 | 35 |
| 4 | 57 |

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**WRITING CUBIC FUNCTIONS:** $f\left(x\right)=ax^{3}+bx^{2}+cx+d$

**\*Remember:** When you are given a table, the **third difference must be constant**

in order to write a cubic function.\*

**How to write a cubic function:**

1. Find the third difference.
2. Make sure you have an initial term – VERY IMPORTANT!
3. Find a, b, c and d.
	1. 6a = third difference
	2. 6a + 2b = first second difference
	3. a + b + c = difference between the first and initial terms
	4. d = y-intercept
4. Write the function – f(x) = ax3 + bx2 + cx + d

Examples:

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| --- | --- |
| 0 | 4 |
| 1 | 10 |
| 2 | 30 |
| 3 | 76 |
| 4 | 160 |
| 5 | 294 |

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|  |  |
| --- | --- |
| 1 | -1 |
| 2 | 1 |
| 3 | -11 |
| 4 | -49 |
| 5 | -125 |
| 6 | -251 |

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|  |  |
| --- | --- |
| 0 | -8 |
| 1 | -6 |
| 2 | 8 |
| 3 | 46 |
| 4 | 120 |

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