**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**QUIZ: ITERATIVE/RECURSIVE AND EXPLICIT FORMULAS**

**Write a recursive formula for each sequence and identify whether it is arithmetic or Geometric sequence.**

|  |  |  |
| --- | --- | --- |
|  | **Recursive Formula** | **Arithmetic or Geometric** |
| 1. 18, 15, 12, 9, …
 |  |  |
| 1. 1, 2, 9, 27, 81, …
 |  |  |
| 1. 7, -3, -13, -23, …
 |  |  |
| 1. 5, 26, 47, 68, 89, …
 |  |  |
| 1. 243, 81, 27, 9, …
 |  |  |
| 1. 80, -120, 180, -270
 |  |  |

**For each recursive formula, write the explicit formula in simplest form. Make sure to identify the first term and the common difference first.**

1. a1 = 19, an = an – 1 – 4
2. a1 = -6, an + 1 = an  + 12

**For each arithmetic sequence, write each recursive formula and explicit formula.**

|  |  |  |
| --- | --- | --- |
|  | **Recursive** | **Explicit** |
| 1. 19, 15, 11, 7, …
 |  |  |
| 1. 7, -2, -11, -20, …
 |  |  |
| 1. -6, -3, 0, 3, 6, …
 |  |  |

11. If an = 2n + 5 is a sequence, find a3, a4, a10.

1. If bn+ 1 = 0.5 $∙b$n is a sequence defined recursively and b4 = 9 , find b7.
2. Suppose you participate in a bike-a-thon for charity. The charity starts with $1100 in donations. Each participant must raise at least $35 in pledges.
3. Is $1100 your a0 or your a1?
4. What is the value a1?
5. Write a recursive formula for this situation.
6. Write a table for this.
7. Write the explicit formula in simplest form.
8. What is the slope of this function?
9. What is the y-intercept of this function?
10. What is the minimum amount raised if there are 75 participants?
11. Elliot borrowed $370 (a0 = 370) from his parents. He will pay them back at the rate of $60 per month.
12. Make a table for this situation.
13. Make a recursive formula for this situation.
14. Write the explicit formula for this situation in simplest form.
15. How much will Elliot still owe after 5 months?
16. How long will it take him to pay everything back to his parents?
17. Candem is collecting bugs for science class. The first day his sister helps him, and he finds 35 bugs. After day 2, he has 52 bugs. On day 3, he has 69 bugs. Write a **recursive and explicit** formula that will represent his collection of bugs. Also, find how many bugs will he has after 15 days?
18. Round 1 of a tennis tournament starts with 128 players. After each round, half the players have lost and are eliminated from the tournament. Therefore, in round 2 there are 64 players, in round 3 there are 32 players and so on. Write a **recursive formula** for the number of players left after each round. Find the number of players after the 4th, 5th and 6th rounds.
19. Paul has $680 in a savings account. He makes a deposit after he receives each paycheck. After one month he has $758 in the account. The next month the balance is $836. The balance after third month is $914.
20. What type of sequence is this? Arithmetic or Geometric
21. Write the recursive function for this situation.
22. Write the explicit function for the amount of money he after each month.
23. How much Paul’s savings after the 4th month?
24. How much will his savings after a year?

**For the next questions, circle the correct answer.**

1. James did an experiment to compare two methods of warming an object. The results are shown in the table below.

|  |  |  |
| --- | --- | --- |
| Time (hours) | Method 1Temperature (°F) | Method 2 Temperature (°F) |
| 0 | 0 | 1.5 |
| 1 | 5 | 3 |
| 2 | 11 | 6 |
| 3 | 15 | 12 |
| 4 | 19 | 24 |
| 5 | 25 | 48 |

 Which statement **best** describes her results?

 A. The temperature using both methods changed at a constant rate.

B. The temperature using both methods changed exponentially.

C. The temperature using Method 2 changed at a constant rate.

D. The temperature using Method 2 changed exponentially.

1. A sequence is shown below.

10, 12, 14, 16 . . .

 What function can be used to determine the *n*th number in the sequence?

1. F(*n*) = *n* + 2
2. F(*n*) = 2*n* + 8
3. F(*n*) = 2*n* + 10
4. F(*n*) = *n*2 + 9
5. The table below shows the cost of a large pizza based on the number of toppings.

|  |  |
| --- | --- |
| Number of toppings (*n*) | Cost (*C*) |
| 1 | $ 17 |
| 2 | $ 18.75 |
| 3 | $ 20.50 |
| 4 | $ 22.25 |

 Which function represents the cost of a pizza, *C*, with *n* toppings?

1. *C(n)* = 17 + 1.75(*n* – 1)
2. *C(n)* = 1.75*n* + 17
3. *C(n)* = 17 + *n*
4. *C(n)* = 17*n*
5. The sequence below shows the number of trees a nursery plants each year.

3, 15, 75, 375 . . .

Which formula could be used to determine the number of trees the nursery will plant next year, NEXT, if the number of trees planted this year, NOW, is known?

1. NEXT = 5 **•** NOW
2. NEXT = $\frac{1}{5}$ **•** NOW
3. NEXT = 3 **•** NOW + 6
4. NEXT = NOW + 6