**Algebra I Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Test Review – Unit 5: Comparing Functions Date: \_\_\_\_\_\_\_\_\_Period:\_\_\_\_**

**Determine the first five terms of the sequence.**

1. an= 2n + 38 \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

2. an= 3(2)n-1 \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

3. a1= -24; an = an-1 + 4 \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

4. a1= 1/3; an = an-1(-3) \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

**Write a rule in explicit form for the nth term of each sequence.**

5. -36, -38, -40, -42, … \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. -3, 12, -48, 192, … \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. a11 = 304; d = 30 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. a12 = -24; a7 = 51 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Write an explicit and recursive rule for the nth term of each sequence. Then find a8.**

9. 2000, 200, 20, 2, … a8 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Explicit Rule: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Recursive Rule: \_\_\_\_; \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10. -4, 2, 8, 14, … a8 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Explicit Rule: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Recursive Rule: \_\_\_\_; \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**State whether the sequence represents a linear function, exponential function, or neither.**

11. 1, 3, 6, 10, 15, … 12. 40, 43, 46, 49, 52, … 13. -4, 12, -36, 108, -324, …

14. A first year teacher is paid $38,000. Each year she is paid an additional 5% over the previous year. Create a function that would represent the teacher’s salary based on the number of years.

Initial Value:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Growth Factor:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Equation:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

15. A top level professional sports organization offers its athletes two different bonus retirement plans. Read each option, then fill in the tables.

**Option 1:** They will start an account and add $20,000 per year for each year the player plays successfully for the organization.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Years Played |  |  |  |  |
| Retirement Account |  |  |  |  |

**Option 2**: They will start an account with $20,000 then add 50% to the value of the account for each year the athlete successfully plays for the team.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Years Played |  |  |  |  |
| Retirement Account |  |  |  |  |

1. Which option would be better for the athlete if he played for the team for 3 years? How much of a difference is there between the two plans?
2. Which option would be better for the athlete if he played for the team for 10 years? How much of a difference is there between the two plans?

16. Mr. Rich recently planted a crop of money trees in his garden. Each tree’s growth is represented below.

|  |  |  |
| --- | --- | --- |
| TREE A | TREE B | TREE C |
| The first tree was five inches tall when planted. It has grown four inches every month since being planted. | Measurements were taken of the second tree and given below |  |

1. Which tree is growing the fastest?
2. Which tree was the tallest when it was first planted?
3. Which Tree is the tallest after six months?

**Determine if the functions are even, odd, or neither.**

17. 18. 19.

20. h(x) = 4x4 – 3x2 + 4 21. g(x)= (x +3)(x -2) 22. f(x)= -6x5 + 3x3 –x

23. Can you write the equation of a line that can be odd or even?

**Explain the transformations of the following functions compared to their respective parent graphs.**

24. **y = (3/4)x**  25. **y = 3x**  26. **y = x2**

 y = 2(3/4)x – 5 y = (1/2)(3)x + 3 + 4 y = -2(x – 1)2 + 6

27. Cindy is reading a summer book and made a plan to finish before school starts. She has already read 38 pages of a 500 page book and plans to read 52 pages each day before school starts. She has 8 days before the start of school. Will she finish in time? Explain.

Equation:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Conclusion:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

28. Jim is the class president at school and promoting acts of kindness. He started a chain reaction at school in which he gives three people a compliment. It is then their individual duty to give three additional compliments to three new people. Every day the number of compliments is tripling as more students get involved. There is a total of 2100 students at the school. The school’s kindness campaign lasts for 7 days. Will all students be given a compliment at the end of the 7 days? Explain.

Equation:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Conclusion:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

29. a. Which function shows a constant rate of change?

b. Which function shows the greatest rate of change for [2, 4]?

c. Which function will increase the fastest as x→∞?

**Determine if the function represented by the table of values is linear, quadratic, exponential, or none of these.**

30. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

31.

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

32. 

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

33**.**  The Drama Club has 250 protein bars to sell

 at the track meet. If it sells 45 bars per hour,

 write a function to represent the number of **g(x)**

 bars remaining after each hour.

 **f(x)**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 f(x) g(x) Greater?

 Linear/Exponential: ­­ \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

 y-intercept: \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **x** | -2 | -1 | 0 | 1 | 2 | 3 |
| **g(x)** | -8 | -13 | -18 | -23 | -28 | -33 |

34. **Use the functions below to answer the following.**



 **f(x) h(x) = 3(¼)x**

* Order the functions above in descending order according to their corresponding
**y-intercepts**.

**y-intercepts**: \_\_\_\_\_\_\_ > \_\_\_\_\_\_\_\_ > \_\_\_\_\_\_\_

* Order the functions above in descending order according to their **average rates of change over the interval of [0, 3]**.

**Avg. ROC [0, 3]**: \_\_\_\_\_\_\_ > \_\_\_\_\_\_\_\_ > \_\_\_\_\_\_\_