Algebra Unit 3 Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Unit 3 Special Functions Study Guide Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Per \_\_\_\_\_\_\_\_\_

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| **Arithmetic Sequences** |
| 1. Give the next 3 terms in the sequence shown below:-3, -1, 3, 9, \_\_\_\_\_\_\_, \_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_Is the sequence arithmetic? Explain why or why not. | 2. Write the recursive formula for the following arithmetic sequence in function form. 34, 23, 12, 1, -10, … |
| 3. Write the explicit formula for the following arithmetic sequence. 13, 16, 19, 22, … | 4. Given the first term and the common difference of an arithmetic sequence find the first five terms and the explicit formula. 𝑓(1)=49,  𝑑=6  |
| 5. Find the 61st and 103rd term in the sequence in #4. | 6. Explain what the difference between a recursive formula and explicit formula. When would each be useful? |
| **Discrete and Continuous Functions** |
| 7. Graph the following function and tell whether it represents a discrete or continuous function. f(x) = -3x + 2 for x > -2Domain: Range: f(1) = \_\_\_\_\_\_ f(-7) = \_\_\_\_\_\_\_ f(9) = \_\_\_\_\_\_\_\_ | 8. Graph the following function and tell whether it represents a discrete or continuous function. f(x) = - ½ x + 3 for x = -6, -4, -2, 0, 2Domain: Range: f(0) = \_\_\_\_\_\_ f(-4) = \_\_\_\_\_\_\_ f(4) = \_\_\_\_\_\_\_\_ |
| 9. Does the following function/relationship represent a discrete or continuous function? Explain

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| --- | --- | --- | --- | --- |
| People | 3 | 4 | 5 | 6 |
| Cost for Movie | $24.75 | $33.00 | $41.25 | $49.50 |

Give the equation of the relationship: | 10. Does the following function/relationship represent a discrete or continuous function? Explain

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Number of Miles | 1 | 2 | 3 | 4 |
| Time (minutes) | 8.52 | 18.33 | 28.14 | 37.95 |

Give the equation of the relationship.  |
| **Piecewise Functions** |
| 11. Given:$$f\left(x\right)=\left\{\begin{matrix}-3x+2, x\leq 3\\5x+13, x>3\end{matrix}\right.$$Determine:$f\left(-1\right)$ and $f\left(3\right)$ | 12. Given:$$f\left(x\right)=\left\{\begin{matrix}12, -2< x\leq 8\\x^{2}-15, 8<x<13\end{matrix}\right.$$Determine:$f\left(3\right)$ and $f\left(15\right)$ |
| 13. Graph the following piecewise function$$f\left(x\right)=\left\{\begin{matrix}-3x+2, x\leq 3\\-5x+13, x>3\end{matrix}\right.$$  | 14. Graph the following piecewise function$$f\left(x\right)=\left\{\begin{matrix}4, x\leq 0\\-4, x>0\end{matrix}\right.$$  |
| 15. Write a piecewise function that models the following situation.The roller skating rink charges the following amount for private parties; for parties with up to 75 guests, the cost is a set-up fee of $450 plus $5 per guest, and for parties with over 75 guests they charge a flat rate of $850.  | 16. Write the piecewise function represented by the given graph.  |