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

Cumulative Midyear Review

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| --- | --- |
| 1. Write the first 4 terms in the geometric sequence where  and r = 3
 | 1. Find an explicit formula for the sequence in #1.
 |
| 1. Find an equation for the inverse of the function: y = 9x + 2.
 | 1. g(x) = {(3, 4), (5, 2), (-1, -2), (8, 4)}
2. What is the domain of g(x)?
3. What is the range of g(x)?
4. Is g(x) a function?
5. Write the inverse of g(x).
 |
| 1. a) Evaluate:

 b) Solve:  | 1. Solve:
 |
| 1. In 1991, the population of Shanghai, China, was about 6.9 million. It is estimated that the population is growing at a rate of about 1.2% annually. If this growth rate continues, what would be the population of Shanghai in the year 2000?
 |
| 8. Simplify  a. b.  | 9. Let *f(x)* = 2x3 + 1, and *g(x)* = 4x2 – 3 1. Find *f(g(1))*
2. Find *g(f(1))*
 |
| 10.  |
| 11.  | 12. Simplify: |
| 13. A ball is thrown upward from a height of 5 feet with an initial velocity of 40 feet per second.  a) Write a particular equation for the height, h(t), of the ball in terms of time (use the equation:)1. What is the height of the ball after two seconds?
2. When does the ball hit the ground?
 |
| 14. a) = b) = | 15. How many x-intercepts does the parabola with equation,  have? |
| 16. Suppose $1000 is invested at an annual interest rate of 5%. Assume that there are no other deposits or withdrawals in this account. {Hint: this equation may be of use: }1. What is the amount in the account after six years if the interest is compounded quarterly?
2. Compounded monthly?
 |
| 17. Factor the following: a)  b)  | c) d)  |
| 18. Given the quadratic: 1. Vertex: \_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Equation for the axis of symmetry: \_\_\_\_\_\_\_\_\_\_\_\_
3. Is this graph congruent to y = 2x2?
4. Graph the parabola *[4pts]*

 *Be sure to accurately plot at least five points* |
| 19. a) What is the degree of the polynomial? \_\_\_\_\_\_b) How many zeros does this polynomial have? 1. Classify the polynomial according to its number of terms.

 1. What is the leading coefficient? \_\_\_\_\_\_\_\_\_

e) find *f(1)* f) Factor completelyg) Find all the zeros of f(x) | 20. Can the data points in the table below be modeled by a polynomial function? If so, find the degree of the polynomial.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| x | 1 | 2 | 3 | 4 | 5 |
| y | 1 | 23 | 85 | 205 | 401 |

 |
| 21. Write an equation (in factored form) of a polynomial function with zeros: 0, -, 7, -2. |
| 22. Expand and write the polynomial in standard form.  a) (5x + 2)(3x2 – 6x + 4) b) (3x – 2)2 | 23. List all the possible rational roots of the polynomial:  |
| 24. The graph of  is shown here.a) How many zeros does the polynomial have? \_\_\_\_\_\_\_\_\_\_\_b) How many of its zeros are real numbers? \_\_\_\_\_\_\_\_\_\_\_\_c) How many of its zeros are non-real (complex) numbers? \_\_\_\_\_\_\_\_\_\_\_ |

ANSWERS

1. 8, 24, 72, 216 2.  3. 

4a. {-1, 3, 5, 8} 4b. {-2, 2, 4} 4c. yes 4d. {(4, 3), (2, 5), (-2, -1), (4, 8)}

5a. 64 5b. x = 5 6. 

7.  million 8a.  8b. 11*i* 9a. 3 9b. 33

10. c 11. 13 + 13*i* 12. 

|  |  |
| --- | --- |
| 13a.  13b. 21 feet 13c.  but only 2.62 makes sense. So, the answer is 2.62 seconds. | 14a.  14b. 15. Because  and 49 > 0, so there are two x-intercepts. Also, since 49 is a perfect square the x-intercepts are rational numbers.16a.  = $1347.3516b.  |

17a.  17b. (x + 5)(x – 10) 17c. (4x + 1)(4x – 1) 17d. 2(x + 2)(x – 6)

|  |  |
| --- | --- |
| 18a. (1, -4) 18b. x = 1 18c. yes19a. 4 19b. 4 19c. trinomial 19d. 2 19e. -16 19f.  19g. {0 (mult 2), 5, -1}20. yes. Degree = 3 21. 22a.  22b. 23. 24a. three 24b. one 24c. two | 18d.   |