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 completely  g) 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. 

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| 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.  = $1347.35  16b. |

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

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| --- | --- |
| 18a. (1, -4) 18b. x = 1 18c. yes  19a. 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. |