**Module 3 Test Review**

(Polynomial Functions 3.1 – 3.8)

*Make a table for each of the following*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| \_\_\_\_\_\_ 1. | Linear |

|  |  |
| --- | --- |
| x | y |
|  |  |

 |
| \_\_\_\_\_\_ 2. | Exponential |

|  |  |
| --- | --- |
| x | y |
|  |  |

 |
| \_\_\_\_\_\_ 3. | Quadratic |

|  |  |
| --- | --- |
| x | y |
|  |  |

 |
| \_\_\_\_\_\_ 4. | Cubic |

|  |  |
| --- | --- |
| x | y |
|  |  |

 |
| \_\_\_\_\_\_ 5. | Logarithmic |

|  |  |
| --- | --- |
| x | y |
|  |  |

 |

6. Label the above functions as whether they or NOT also be considered a polynomial function.

7. If $\left(x\right)=x^{3}+27$, then what is $f(-4)$?

8. Factor $x^{3}+125$,

9. How many **real** roots does the function $f\left(x\right)=x^{3}+125$ have?

10. How many roots (both **real** AND **complex**) does the function $f\left(x\right)=x^{3}+125$ have?

11. Write the function in factored form that has roots -2 and 3

12. Write the function in standard form that has roots 2 and -3

*Use the equations below to answer questions 13 – 19.*

$f\left(x\right)=x-2$ $g\left(x\right)=x^{2}-4$ $h\left(x\right)=x^{3}-8$

13. Find $f\left(x\right)+h(x)$ 14. Find $g\left(x\right)-f(x)$

15. Find $f\left(x\right)∙h(x)$ 16. Find $f(x)(\left(h\left(x\right)+g(x)\right)$

17. Find ALL of the roots of $f(x)$ 18. Find ALL of the roots of $g(x)$

19. Factor $h(x)$ into two polynomials

20. Write a polynomial in **factored** **form** that has a leading coefficient of -2, and the following roots: 2, -3, 4

21. Write a polynomial in **standard** **form** that has a leading coefficient of 2, and the following roots: 2, -3, 4

22. Write a polynomial in factored form that has a leading coefficient of 2, and the following roots: -3 , 3 , 2. Make a table of values for this function.

|  |  |
| --- | --- |
| x | y |
|  |  |

23. Graph the polynomial from #22.

24. a. What are the x-intercepts from #22 above? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 b. What is the y-intercept from #22 above? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

25. Use the polynomial from #22 above.

 a. $as x\rightarrow \infty , f(x)\rightarrow \\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$

 b. $as x\rightarrow -\infty , f(x)\rightarrow \\_\\_\\_\\_\\_\\_\\_\\_\\_$