Algebra 2/ Trig IB Chapter 2 Test Review 2019 Name:_____

Do all work on scrap paper!! There are graphs for #s 13 and 14 on the back you may use.

Complete the square to find the vertex and the axis of symmetry. Then, graph the quadratic. Plot at least 5 points including the vertex. You may use your own graph paper. If you scale your graph, make sure to indicate doing so.

1.) $f(x) = 2x^2 + 12x - 4$

2.) $g(x) = x^2 + 4x + 10$

3.) Divide $x^3 - 2x^2 - 9$ by $x - 3$ using synthetic division.

4.) Divide $6x^4 - x^3 - x^2 + 9x - 3$ by $x^2 + x - 1$ using polynomial long division.

Simplify the following.

5.) $(-2 + \sqrt{-8}) + (5 - \sqrt{-50})$

6.) $(2 + 3i)^2 + (2 - 3i)^2$

7.) $-\frac{14}{2i}$

8.) $\frac{6-7i}{1-2i}$

Use polynomial long division or synthetic division to find all of the ***rational*** zeros of the given functions. Then, use them to completely factor the polynomial. You must use synthetic for at least one of these problems. You only need to utilize synthetic division one time in the process. (You may use it more if you wish).

9.) $t(x) = x^3 - 4x^2 - x + 4$

10.) $p(x) = x^4 + 6x^3 + 10x^2 + 6x + 9$

11.) Write $s(x) = x^4 + 6x^2 - 27$ as the product of linear factors, and list **all** of its zeros.

12.) Write a polynomial function with real coefficients that has the given zeros. $6, \quad -5 + 2i$

Sketch the graph of each rational function. List the x and y intercepts, asymptotes, and test points. These must all be included on the graph as well. Finding additional points to plot is optional, however if you choose to find any please list them. (there are graphs on the back of this paper that you can use if needed)

13.) $f(x) = \frac{2x+5}{x-1}$

14.) $k(x) = \frac{x-3}{x^2-3x-10}$

Solve each nonlinear inequality. Show all work.

15.) $3x^3 - 4x^2 - 12x > -16$

16.) $\frac{3x-5}{x-3} \leq 1$

Use Descarte's Rule of Signs to determine the possible number of positive and negative zeros of each function.

17.) $a(x) = 3x^3 + 2x^2 + x + 3$

18.) $2x^4 - 3x + 2$

Graphs for #s 13 and 14