Pre-Calculus Q1 Cumulative Review

Complete on a Separate Sheet of Paper

Part 1:

For each of the functions below, answer the following questions:

$f(x) = x^2 + 4$	$g(x) = \sqrt{2x-3} + 1$	$h(x) = \frac{2}{x}$

1. Find the domain and range for each.

2. Find the inverse for each function. Are the inverses functions?

3. Find the domain and range for each inverse.

4. Determine whether each function is even, odd, or neither (both algebraically and graphically).

5. Which of the above functions are:
   Bounded below? Increasing over their entire domain? A one-to-one function?

6. Find g(f(x))

7. State the graph transformations from $y = \sqrt{x}$ to g(x).

Part 2:

Use the following functions to evaluate key features of its graph:

$f(x) = \frac{x^2-3x-10}{x^2-4}$	$g(x) = x^3 - 5x^2 + 2x + 8$	$h(x) = \frac{x^3+2x-3}{x+2}$

8. Find all asymptotes and removable discontinuities for f(x) and h(x).

9. Find $\lim_{x\to-\infty} g(x)$, and $\lim_{x\to\infty} g(x)$

10. Find $\lim_{x\to-2^-} f(x)$, and $\lim_{x\to-2^+} h(x)$

11. State the intervals where g(x) is increasing / decreasing.

Part 3:

Answer the following:

12. Write the equation of a line given f(3) = 1 and f(-2) = 6.

13. Write the equation of a parabola whose vertex is at (-2,1) and contains (-4,-7).

14. Solve: $\sqrt{5x+1} = x - 1$ 4) Write $y = 2x^2 - 8x + 5$ in VERTEX form.

15. Write the equation of a polynomial whose zeros include 2 and 3+2i.

16. Solve $x^3 + x^2 - 6x \geq 0$ algebraically and graphically.

17. Find ALL the zeros for $y = x^4 - x^3 - 3x^2 + 17x - 30$.

*****Also Know: Box Problems, Zeros/Multiplicity, Graphing a "Piece-Wise" function, Imaginary numbers, etc.*****