Precalculus   Name: _____

Chapter 2.5 – 2.9 Review   Block: _____
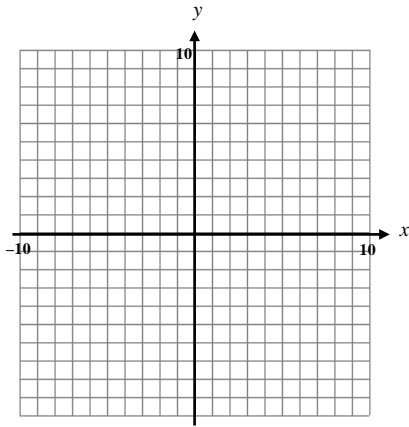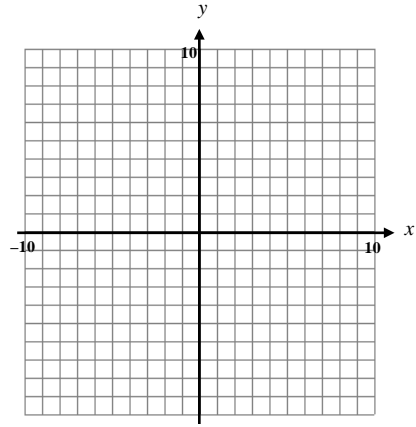
NO CALCULATOR

For questions 1 – 3, find the following:

      a) All asymptotes (horizontal, vertical, and slant), if they exist.

      b) All intercepts (*x* and *y*), if they exist.

      c) Holes, if they exist.

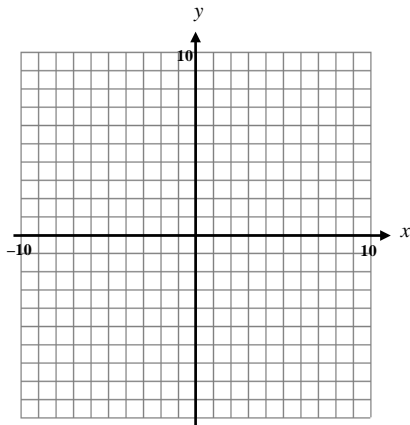   **d) The graph of each function … plot at least 3 points per region.**

1. $y = \dfrac{2x+3}{x-1}$

2. $y = \dfrac{x^2 - 2x - 8}{x - 4}$

3. $y = \dfrac{2x^2 + 4x - 6}{x+1}$

4. Solve the following equation: $x^2 - 6x + 13 = 0$

Algebraically solve each inequality.

5. $(x-4)(x+3)^2 < 0$

6. $\dfrac{3x+2}{(x+1)(2x)} \le 0$

7. $\dfrac{1}{x+2} - \dfrac{2}{x-1} > 0$

8. [Chapter P Review] Simplify: $\dfrac{m^3\left(3a\right)^{-4}}{m^{-7}a^{-3}}$

9. [Chapter P Review] Solve the following equation: $4\left|2x-3\right|-9 > 15$

10. [Chapter 1 Review] Graph the following equation. Identify at least 3 points on the graph. $y = -\sqrt{3x-9}$
Describe the transformation.

11. Given: $g(x) = x^4 - 2x^3 + 13x^2 - 32x - 48$.
    (a) Use graphing, synthetic division and the quadratic formula to find all zeros.

    (b) Write the factorization of $g(x)$ as a product of linear factors and irreducible quadratic factors.

12. Write an equation for the quadratic function with a vertex of $(-3, 4)$ and containing point $(-5, -8)$

13. Find a polynomial of degree 3 with roots -4, and $5 - i$. Express the answer in standard form.

14. Perform the indicated operation.

    (a) $(3 - 4i) - (-8 + 2i)$ (b) $\dfrac{3 + i}{2 - 3i}$ (express the answer in $a + bi$ form)

15. [Review Chapter 2a] Find the cubic regression equation (without rounding ANYTHING) for the following data. Let $x = 0$ be the year 1970. Use your equation to predict the number of employees in the year 2004.

Year	1972	1975	1978	1980	1983	1986
Number of Employees	247	475	658	546	493	605