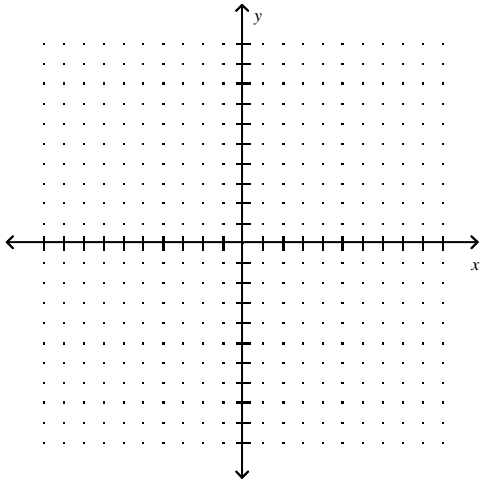
Pre-Calculus A
Chapter 4 Review
Non-Calculator Name _____

For #1, use the following directions:
a. List each real zero and its multiplicity.
b. Determine whether the graph crosses or touches the x-axis at each x-intercept
c. Determine the maximum number of turning points on the graph.
1. $f(x) = 3x\,(x^2 + 4)^2\,(x - 5)^3\,(x + 1)^2$

For #2, use the following directions:
a. Determine the end behavior of the graph of the function.
b. State the x-intercept(s).
c. State the y-intercept.
d. Find any additional points needed to graph the function.
e. Sketch the graph of the function.
2. $f(x) = \frac{-1}{4}\,(x - 3)\,(x + 1)^3$



For #3, determine the maximum number of real zeros that the polynomial function may have. Then list the potential rational zeros of each polynomial function. Do not attempt to find the zeros.

3. $f(x) = 5x^4 - 2x^3 + 8x - 10$

For #4 – 5, use the given zero to find the remaining zeros of each function.

4. $f(x) = 4x^4 + 11x^3 + 97x^2 + 275x - 75$ zero: $5i$

5. $f(x) = x^3 - 4x^2 - 2x + 20$ zero: $3 + i$

For #6, find the domain of the rational function.

6. $f(x) = \frac{4x}{x^2-3x-18}$

For #7 – 10, find the vertical, horizontal, and oblique asymptotes, if any, of each rational function.

7. $f(x) = \frac{5-3x}{5+3x}$

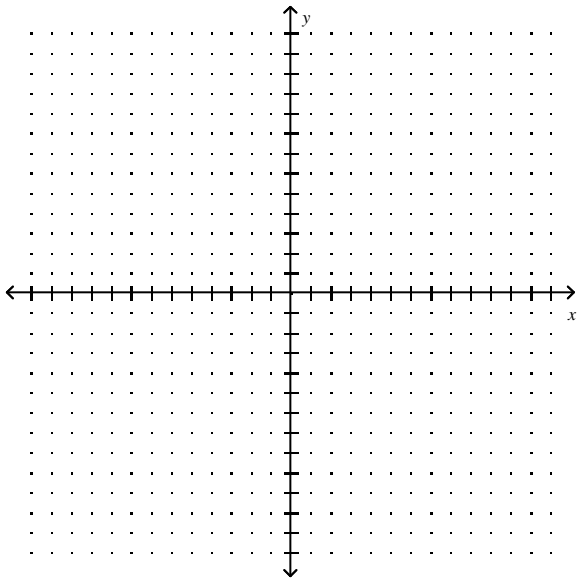
8. $f(x) = \frac{8}{(x-6)^2}$

9. $f(x) = \frac{x^3-27}{x^2-7x+12}$

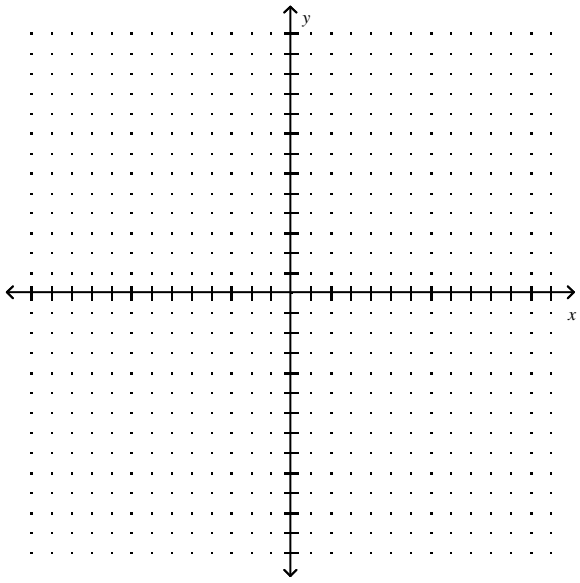
10. $f(x) = \frac{6x^2-23x+7}{2x-7}$

For #11 – 13, use the following steps to analyze the graph of the rational function.
Step 1: Factor the numerator and denominator.
Step 2: Write the function in lowest terms.
Step 3: Find the domain of the rational function.
Step 4: State the vertical asymptote(s), if they exist.
Step 5: State the horizontal and oblique asymptote(s), if they exist.
Step 6: State the intercepts of the function.
Step 7: Find any necessary extra points
Step 8: Graph by hand.

11. $f(x) = \frac{x}{x^2 - x - 30}$



12. $f(x) = \frac{x^2-3x-10}{x-1}$



13. $f(x) = \frac{x^2+3x-28}{x-4}$