

EXTRA-CREDIT OF MATH 30: PRECALCULUS. FALL 2012

- (5 points) Given the functions $f(x) = x^2 + 2x + 1$ and $g(x) = -2x - 1$. Find $f \circ g(x)$ and $g \circ f(x)$.
- Given the polynomial function $g(x) = 2(x + 1)(x - 2)^2(x - 4)$.
 - (2 points) Find the y -intercept.
 - (5 points) Find the zeroes and their multiplicities.
 - (2 points) Find the leading term.
 - (4 points) Sketch the graph of $y = f(x)$.
 - (5 points) Estimate the x, y coordinates of the local extrema: max and min. Estimate based on your graph the intervals where the function is increasing and the intervals where the function is decreasing.
 - (2 points) Estimate based on your graph the value of $f(-.4) \approx$
- Given the polynomial $f(x) = 3x^3 + 4x^2 - 5x - 2$:
 - (3 points) Find the list of all possible zeroes.
 - (3 points) Is $x = 1/2$ a zero of $f(x)$? Why?
 - (9 points) Find the actual zeroes of $f(x)$.
 - (3 points) Factor $f(x)$ completely.
- Given the rational function $f(x) = \frac{x^2 - 3x - 4}{2x^2 - 8}$
 - (2 points) Find the y -intercept and the x -intercepts.
 - (3 points) Find the domain of $f(x)$.
 - (3 points) Find the zeroes of $f(x)$.
 - (5 points) Solve the equation $f(x) > 0$. What is the meaning of $f(x) > 0$ in the graph?
 - (4 points) Find the equation of the vertical and horizontal asymptotes.
 - (3 points) Estimate the value of $f(10^{100})$ without doing any actual computation.
- (10 points) Sketch the graph of the rational function $f(x) = \frac{3x-1}{2x+2}$. Do not forget to include asymptotes, domain, zeroes and y -intercept.
- Given $f(x) = 2^x - 3$
 - (3 points) Filled up a table of values with $x = -3, -2, -1, 0, 1, 2, 3$.
 - (3 points) Find the inverse f^{-1} and a table of values to graph it.
 - (5 points) Sketch both functions $f(x)$ and $f^{-1}(x)$ in the same set of coordinate axis. What symmetry do you observe?
 - (4 points) State intercepts and asymptotes for f and f^{-1} .
- Compute the x in each case:
 - (8 points) $\log_2(x) = 5$, $\log_x(3) = 2$, $\log_8(4) = x$, $\log_{27}(3)$
 - (4 points) Given $\log_a(2) = 3$ find the value of: $x = \log_a(4a)$, $x = \log_a(8a^2)$

8. (5 points) Find domain of the function $f(x) = \log_2(x - 4) + \log_2(x + 3)$.
- (a) (5 points) Solve the equation $\log_2(x - 4) + \log_2(x + 3) = 3$ on its domain.
9. (5 points) Solve the equation $3(5^{x-3} + 2) = 10$. Express your answer using log's in base 10.