

THIRD EXAM, MATH 30: PRE-CALCULUS. SPRING 2013

Do all questions and show all the work. The total number of points in the test is 150.

- Given the polynomial $f(x) = 3x^3 + 4x^2 - 5x - 2$:
 - (5 points) Find the list of all possible zeroes.
 - (5 points) Is $x = 1/2$ a zero of $f(x)$? Why?
 - (10 points) Find the actual zeroes of $f(x)$.
 - (5 points) Factor $f(x)$ completely.
 - (5 points) Sketch the graph of $f(x)$.
- Given the rational function $f(x) = \frac{x^2-3x-4}{2x^2-8}$:
 - (5 points) Find the y -intercept.
 - (5 points) Find the x -intercepts.
 - (5 points) Find the domain of $f(x)$.
 - (5 points) Find the equation of the vertical and horizontal asymptotes.
 - (10 points) Solve Inequality $f(x) \leq 0$.
 - (5 points) Sketch the graph $y = f(x)$.
- Given $f(x) = 4^{x-2} - 3$:
 - (5 points) Filled up a table of values with $x = 0, 1, 2, 3, 4$.
 - (5 points) Find the equation of 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?
 - (5 points) State intercepts and asymptotes for f and f^{-1} .
- (10 points) Compute the x in each case:
 - $\log_2(x) = 5$,
 - $\log_x(3) = 2$
 - $\log_8(4) = x$
 - $\log_{27}(1/9) = x$
- (5 points) Given $\log_b(x) = 3$ and $\log_b(y) = -9$, find $\log_b(xy)$ and $\log_b(x/y)$.
- (5 points) Find domain of the function $f(x) = \log_2(x - 4) + \log_2(x + 3)$.
 - (5 points) Solve the equation $\log_2(x - 4) + \log_2(x + 3) = 3$ on its domain.
- (5 points) Solve the equation $3(5^{x-3} + 2) = 10$. Round your answer to the nearest thousandth.
- (10 points) Find the value of:
 - $\sin(11\pi/4)$
 - $\cos(4\pi/3)$
 - $\tan(11\pi/6)$
 - $\sin(5\pi/3)$
- Solve the equations in the interval $[0, 2\pi)$.
 - (5 points) $2\sin(x) + \sqrt{3} = 0$.
 - (5 points) $(2\cos(x) - 1)(\cos(x) - 2) = 0$.
- Given the function $f(x) = 3\sin(2x - \pi)$.
 - (5 points) Identify Amplitude, Period and Phase Shift.
 - (5 points) Sketch One cycle of $y = f(x)$.
 - (5 points) Identify in the graph, the maxima, the minima and the zeroes.