

PRACTICE EXAM 3 - MATH 111

DATE: Wednesday, November 2

INSTRUCTOR: George Voutsadakis

Read each problem very carefully before starting to solve it. Each question is worth 3 points. It is necessary to show your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

1. Study (find the vertex, the opening direction, the intercepts and roughly sketch the graph) the function $f(x) = -\frac{5}{9}x^2 + \frac{20}{9}x + \frac{25}{9}$.
2. Find the equation of a parabola with vertex at $V = (-3, -10)$ that passes through the point $(1, -2)$.
3. (a) Study (find the x - and y -intercepts, create the sign table, and roughly sketch the graph) the polynomial function $f(x) = x^2(x + 3)(x - 5)$.
(b) Solve the polynomial inequality $x^4 - 2x^3 - 15x^2 \leq 0$.
4. Find an equation for a polynomial function of degree 4, with roots $-2, -5$, each of multiplicity 1, and root 1 of multiplicity 2, whose graph has y intercept $y = 17$.
5. Study (find the domain, the x - and y -intercepts, the horizontal and vertical asymptotes, create the sign table, and roughly sketch the graph) the rational function $f(x) = \frac{1-x}{x(x+2)^2(x-2)}$.
6. The sum of the perimeters of two given squares is equal to 40 feet. Find the dimension of each square that will minimize the sum of the areas of the two squares.