

Show **ALL** work for credit; be neat. Calculators can be used for graphing and calculating only. Give exact answers when possible.

1. Solve this system of two equations in two unknowns  $(x - 1)(y - 2)(x - y) = 0$  and  $(x - 5)(x + y) = 0$ .

2. Some of the critical points of the function  $f(x, y) = x^4 - x^2y^2 + 3x^2y + y^3 - 4x^2 - 4y^2 + 4y + 5$  are given in the left hand column of the table below. Classify the critical points by completing the table.

$(x, y)$	$f_{xx}$	$f_{yy}$	$f_{xy}$	big D	Local Extrema Classification
(1, 1)					
(0, 2)					
(0, 2/3)					
$(\sqrt{11}/4, 5/2)$					