

MAT 111 Exam 2

Name:

Section #:

Question:	1	2	3	4	5	6	7	Total
Points:	6	9	18	6	6	10	10	65
Score:								

Directions: **SHOW ALL WORK.** Answers without justification may receive zero points.

1. (6 points) Find the equation for the tangent line of

$$x^2 + 2xy - y^2 + x = 2$$

at the point (1, 2).

$$2x + 2y + 2x \frac{dy}{dx} - 2y \frac{dy}{dx} + 1 = 0$$

$$\frac{dy}{dx} (2x - 2y) = -2x - 2y - 1$$

$$\frac{dy}{dx} = \frac{-2x - 2y - 1}{2x - 2y}$$

$$\text{At } (1, 2) \quad \frac{dy}{dx} = \frac{-2 - 4 - 1}{2 - 4} = \frac{-7}{-2} = \frac{7}{2}$$

$$\boxed{y - 2 = \frac{7}{2}(x - 1)}$$

2. If possible create a graph of a function satisfying each description. If it is not possible, explain why.

- (a) (3 points) A continuous function with an absolute maximum of 4 and no absolute minimum, whose domain is $[-1, 1)$.

