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III. The displacement of an object (in meters) moving along a straight path is given by the function $f(x) = 2 - x + x^2$ where x is given in seconds. To your right you are given a graph of this function. (12 points total)

(a) USE THE DEFINITION OF THE DERIVATIVE FUNCTION to show that f'(x) = -1 + 2x. (8 points)

(b) Find the velocity of the object at x = 1 second. (1 point)

(c) Find the equation of the line whose slope represents the velocity found in part (b). Accurately graph this line on the graph of f given above. (3 points)