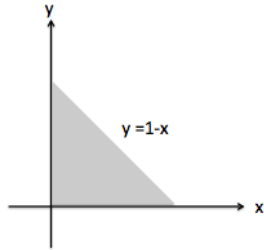**1.** [10 points] Indicate if each of the following is true or false by circling the correct answer. No justification is required.

    a. [2 points] Let $(\bar{x},\bar{y})$ be the center of mass of the metal plate bounded by the line $y = 1-x$, the x-axis and the y-axis for $0 \le x \le 1$.

    If the plate has uniform mass density, then $\bar{x} = \bar{y}$.

                                              True   False

    b. [2 points] The function $F(x) = \displaystyle\int_{1}^{x^2} \sin(e^t)dt$ is an even function.

                                              True   False

    c. [2 points] Let $h(x)$ be an antiderivative of $g(x)$. If $g(x)$ is measured in kg and x in inches, then the units for $h(x)$ are kg per inch.

                                              True   False

    d. [2 points] The function $R(t) = \displaystyle\int_{t}^{1-t} e^{x^3}dx$ is decreasing for all values of t.

                                              True   False

    e. [2 points] The length of the curve $y = x^2$ from $x = 0$ to $x = 2$ is smaller than 4.

                                              True   False