

1. [8 points] Indicate if each of the following is true or false by circling the correct answer. No justification is required.

a. [2 points] The function  $y(t) = \cos(4t)$  is a solution to the differential equation  $y'' + 16y = 0$ .

True                  False

b. [2 points]  $\int_1^2 \tan x \, dx$  is an improper integral.

True                  False

c. [2 points] If  $r = f(\theta)$  is a function in polar coordinates with  $f''(\theta) > 0$ , then its graph in the  $x$ - $y$  plane is concave up.

True                  False

d. [2 points] The median of the probability density function

$$p(x) = \begin{cases} \frac{1}{x^2} & x \geq 1. \\ 0 & x < 1. \end{cases}$$

is equal to 2.

True                  False