

**10.** [8 points] Each of the following statement is either False (there are counter-examples to the statement), True, or True if a condition holds. For each, circle the correct characterization (obviously, a True statement is also True if the condition holds; circle “True” in this case, not “True if. . .”). No explanations are necessary.

(a) [2 points of 8]  $y = 3x^2$  is a solution to  $xy' = 2y - b$

True

False

True if  $b = 0$ 

(b) [2 points of 8]  $\int_{-1}^1 \frac{1}{1+kx^2} dx$  is an improper integral.

True

False

True if  $k \leq -1$ 

(c) [2 points of 8] If  $F'(x) = x \sin(e^x)$ , then  $F(x) = \int_0^\infty t \sin(e^t) dt$ .

True

False

True if  $F(0) = 0$ 

(d) [2 points of 8]  $F(t) = \begin{cases} 0, & t < 0 \\ t/a, & 0 \leq t < a \\ 1, & t \geq a \end{cases}$  could be a cumulative distribution function.

True

False

True if  $a = 1$