

NAME: KEY

YOUR GRADE IS BASED ON THE PROCESS AS WELL AS THE FINAL RESULT. SHOW ALL YOUR STEPS CLEARLY SO YOU WILL BE ELIGIBLE FOR THE MOST PARTIAL CREDIT. YOU MAY USE A CALCULATOR, BUT NO NOTES, BOOKS, OR OTHER STUDENTS. GOOD LUCK!

1.) (5 pts.) Use the formula we discussed in class (also known as Theorem 14) to solve the IVP  $y' = 0.1y$ ,  $y(0) = 100$ .

To solve  $y' = ky$ ,  $y(0) = A$ , use

$$y = A e^{kt}$$

Here:  $k = 0.1$ ,  $A = 100$ , so

$$y = 100 e^{0.1t}$$

2.) (5 pts.) How did we define the number  $e$ ?

$e$  is the number for which,

if  $f(x) = e^x$ , then  $f'(0) = 1$