

Each problem is worth 5 points. Clear and complete justification is required for full credit.

1. Does the differential equation  $\frac{dH}{dt} = 325 - H$  have the function  $H = 325 - Ae^{-t}$  as a solution?

$$H = 325 - Ae^{-t}$$

$$H' = -Ae^{-t} \cdot -1$$

$$\underline{H' = Ae^{-t}}$$

$$Ae^{-t} = \cancel{325} - [325 - Ae^{-t}]$$

$$Ae^{-t} = Ae^{-t}$$

$$\underline{Ae^{-t} = Ae^{-t}}$$

Great

Yes!  $325 - Ae^{-t}$  is a solution to the  
Differential equation  $325 - H$ !

2. Does the differential equation  $y'' - 2y' - 15y = 0$  have the function  $y = e^{5t}$  as a solution?

$$y = e^{5t} \quad y' = 5e^{5t} \quad y'' = 25e^{5t}$$

$$25e^{5t} - 2(5e^{5t}) - 15(e^{5t}) = 0$$

$$e^{5t} (25 - 10 - 15) = 0$$

$$\underline{e^{5t} \cdot 0 = 0}$$

Great

Yes!

$$y = e^{5t} \text{ is A}$$

Solution