

Differential Equations

Q.  $(t+5) dy - (y+9) dt = 0$  . Calculate/find the differential equation.

$$(t+5) dy = (y+9) dt$$

$$\int \frac{dt}{t+5} = \int \frac{dy}{(y+9)}$$

$$\log(t+5) + c_1 = \log(y+9) + c_2$$

$$\log(t+5) - \log(y+9) = c_2 - c_1$$

$$\log\left[\frac{y+9}{t+5}\right] = \log\left(\frac{c_2}{c_1}\right) \ln c$$

$$\log\left(\frac{y+9}{t+5}\right) = \ln c$$

$$\frac{(y+9)}{(t+5)} = c$$

$$(y+9) = (t+5) c \text{ ans.}$$

Q.

$dy = 3t^2 y dt$  . Find the differential equation.