(#5) a) $\frac{dP}{2P}$

$P = Ce^{2t}$

$\frac{dP}{dt} = \frac{d}{dt}(Ce^{2t}) = 2\underbrace{Ce^{2t}}_{P}$

$\frac{dP}{dt} = 2P$ ✓

b) $P = e^{2t} + C$

$\frac{dP}{dt} = \frac{d}{dt}(e^{2t}+C) = 2e^{2t} + 0$

$2e^{2t} \stackrel{?}{=} 2P \quad \Rightarrow 2P = 2(e^{2t}+C)$

$= 2e^{2t} + 2C$

$2e^{2t} \neq 2e^{2t} + 2C$ ✓

$\therefore$ $P = e^{2t} + C$ is not a solution

(#7) a) find $\frac{dy}{dt}$ if $y = e^t + \ln t$

$\frac{dy}{dt} = \frac{d}{dt}(e^t + \ln t) = e^t + \frac{1}{t}$

find $y - \frac{y}{t}$

$y - \frac{y}{t} = e^t + \ln t - \frac{e^t + \ln t}{t}$

$\therefore$ $\frac{dy}{dt} \neq y - \frac{y}{t}$

and $y$ is <u>NOT</u> a solution