4 (20 points) A 1 kg mass is attached to a spring with spring constant 4 Newtons/m and is forced by an external force of $5\sin(3t)$ Newtons. At time $t = 0$, the system is at the equilibrium position ($y = 0$) with initial velocity $y' = -1$ m/s.

(a) Write down the initial value problem and find the solution

(b) Express the solution as a product and sketch the graph of the solution, illustrating any interesting phenomenon.