A) The characteristic equation for $2y''(x) - 3y'(x) + y(x) = 0$ is
$2r^2 - 3r + 1 = 0$. It has roots $r_1 = 1$ and $r_2 = \frac{1}{2}$. Hence $y = c_1 e^x + c_2 e^{x/2}$ is
the general solution. To match $y(0) = 2$ and $y'(0) = \frac{1}{2}$ we need $c_1 + c_2 = 2$ and
$c_1 + \frac{1}{2}c_2 = \frac{1}{2}$. Hence $c_1 = -1$ and $c_2 = 3$.

B) To find an equation $ay'' + by' + cy = 0$ whose general solution is
$y = c_1 e^x + c_2$ note that $r_1 = 1$ and $r_2 = 0$. So the characteristic equation must
be $(r - 1)(r - 0) = r^2 - r = 0$. Hence $y'' - y' = 0$ is the corresponding equation.