Part I Problems

Solve the following IVP's by using the Laplace transform.

Problem 1: $y' - y = e^{3t}, \;\; y(0^-) = 1$

Problem 2: $y'' - 3y' + 2y = 0, y(0^-) = 1, y'(0^-) = 1$

Problem 3: $y'' + 4y = \sin t, \;\; y(0^-) = 1, y'(0^-) = 0$

Problem 4: $y'' - 2y' + 2y = 2e^t, \;\; y(0^-) = 0, y'(0^-) = 1$

Problem 5: $y'' - 2y' + y = e^t, \;\; y(0^-) = 1, y'(0^-) = 0$

Problem 6: $x'' - 6x' + 8x = 2, \;\; x(0^-) = x'(0^-) = 0$

Problem 7: Solve the IVP $x^{(4)} + 2x'' + x = e^{2t}; \;\; x(0^-) = x'(0^-) = x''(0^-) = x^{(3)}(0^-) = 0$

Problem 8: Find the Laplace transform of $f(t) = (u(t) - u(t - 2\pi))\sin(t)$ by use of the t-shift rule.

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