2) $3\frac{dy}{dt} - 6y = \sin 2t$ at $y=1, t=0$

$3[sy(s) - y(0)] - 6y(s) = 2/(s^2+4)$

$s(sy(s) - 1) - 6y(s) = 2/(s^2+4)$

$3sy(s) - 6y(s) = 2/(s^2+4) + 3$

$y(s)(3s-6) = \frac{2+3s^2+12}{s^2+4}$

$y(s) = 3s^2 + 14 / (s^2+14)(3s-6)$

$\frac{3s^2+14}{(s^2+4)(3s-6)} = \frac{A+Bs}{(s^2+4)} + \frac{C}{(3s-6)}$

At C, $3s - 6 = 0$

$6 - 5 = 3B - 2B$

$1 = B \therefore B = 1$

$A + 1 = 2$ $\quad A = 2 - 1$

$A = 1$

$$y(s) = \frac{1}{s+2} + \frac{1}{s+3}$$

$$y(t) = e^{-2t} + e^{-3t}$$

2) $3\,dy/dt - 6y = \sin t$ at $t = 0$, $y = 1$

$3[sy(s) - y(0)] - 6y(s) = 1/s^2+1$

$3(sy(s) - 1 - 6y(s) = 1/s^2+1$

$3[y(s) - 6y(s) = 1/s^2+1 + 3$

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15/ENG02/042
Computer Engineering (ASS 5)

1. $dy/dt + 3y = e^{-2t}$ given that $t = 0$, $y = 2$

$x' + 3y = e^{-2t}$

$L[f'(t)] = sL[f(t)] - f(0)$

$sy(s) - y(0) + 3y(s) = 1/s + 2$

$sy(s) - 2 + (s) = 1/s + 2$

$sy(s) - 2 + 1/s + 2$

$sy(s) = 1/s + 2 + 2$

$3A - 6B = 0$

$3A - 6(-1/12) = 0$

$A = -1/6$

$$Y(s) = \frac{-1/6}{(s^2+4)} - \frac{1/12 s}{(s^2+4)} + \frac{13/4}{(3s-6)}$$

$$Y: \frac{-1/6}{(s^2+4)} - \frac{1/12 s}{s^2+4} + \frac{13/4}{(3s-6)}$$

$= -1/6(\quad) - 1/12(s^2+4) + 13/4(\quad)$