```
(*-----------------Problema 1------------------*)
eq1 = y'''[x] - 3 y''[x] + 3 y'[x] - y[x] == 0;
ic1 = {y[0] == 1, y'[0] == 1, y''[0] == 1};
sol1 = DSolveValue[{eq1, ic1}, y[x], x];
Print["Solución 1: ", sol1];
Print["Verificación C.I. (y(0), y'(0), y''(0)) = ",
   {sol1 /. x → 0, (D[sol1, x] /. x → 0), (D[sol1, {x, 2}] /. x → 0)}];


(*-----------------Problema 2------------------*)
eq2 = y''[x] + y'[x] == x;
ic2 = {y[0] == 0, y'[0] == 0};
sol2 = DSolveValue[{eq2, ic2}, y[x], x];
Print["\nSolución 2: ", sol2];
Print["Verificación C.I. (y(0), y'(0)) = ", {sol2 /. x → 0, (D[sol2, x] /. x → 0)}];


(*-----------------Problema 3------------------*)
eq3 = y''[x] + y'[x] - 12 y[x] == 3 Exp[4 x];
ic3 = {y[0] == 0, y'[0] == 6};
sol3 = DSolveValue[{eq3, ic3}, y[x], x];
Print["\nSolución 3: ", sol3];
Print["Verificación C.I. (y(0), y'(0)) = ", {sol3 /. x → 0, (D[sol3, x] /. x → 0)}];


(*-----------------Problema 4------------------*)
eq4 = y'''[x] - 2 y''[x] + y'[x] == 2 Exp[x] + 2 x;
ic4 = {y[0] == 0, y'[0] == 0, y''[0] == 0};
sol4 = DSolveValue[{eq4, ic4}, y[x], x];
Print["\nSolución 4: ", sol4];
Print["Verificación C.I. (y(0), y'(0), y''(0)) = ",
   {sol4 /. x → 0, (D[sol4, x] /. x → 0), (D[sol4, {x, 2}] /. x → 0)}];


(*Opcional:simplificar las soluciones para una forma más legible*)
Print["\nSoluciones simplificadas:"];
Print["S1 = ", FullSimplify[sol1]];
Print["S2 = ", FullSimplify[sol2]];
Print["S3 = ", FullSimplify[sol3]];
Print["S4 = ", FullSimplify[sol4]];
```

Solución 1: e^x

Verificación C.I. $(y(0), y'(0), y''(0)) = \{1, 1, 1\}$

Solución 2: $\frac{1}{2} e^{-x} \left(-2 + 2 e^x - 2 e^x x + e^x x^2\right)$

Verificación C.I. $(y(0), y'(0)) = \{0, 0\}$

Solución 3: $\frac{3}{56} e^{-4x} \left(-15 + 8 e^{7x} + 7 e^{8x}\right)$

Verificación C.I. $(y(0), y'(0)) = \{0, 6\}$

Solución 4: $(2 + x) (2 - 2 e^x + x + e^x x)$

Verificación C.I. $(y(0), y'(0), y''(0)) = \{0, 0, 0\}$

Soluciones simplificadas:

S1 $= e^x$

S2 $= 1 + \frac{1}{2} (-2 + x) x - \text{Cosh}[x] + \text{Sinh}[x]$

S3 $= \frac{3}{56} e^{-4x} \left(-15 + e^{7x} (8 + 7 e^x)\right)$

S4 $= (2 + x) (2 + e^x (-2 + x) + x)$