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Inhom = y''[t] + 3 * y'[t] - y[t] == 6 * Exp[t] - 9 * Exp[2 * t];
hom = y''[t] + 3 * y'[t] - y[t] == 0;
Shom = DSolve[hom, y[t], t]

Shom = y[t] /. Shom[[1]]

y1 = Shom /. {C[1] -> 1, C[2] -> 0}
y2 = Shom /. {C[1] -> 0, C[2] -> 1}

Wronskiaan = Det[{{y1, y2}, {D[y1, t], D[y2, t]}}]

yp = -y1 * Integrate[y2 * (6 * Exp[t] - 9 * Exp[2 * t]) / Wronskiaan, t] +
      y2 * Integrate[y1 * (6 * Exp[t] - 9 * Exp[2 * t]) / Wronskiaan, t]

gsol1 = Shom + yp // Simplify

gsol2 = (y[t] /. (DSolve[Inhom, y[t], t])[[1]]) // Simplify

If[gsol1 == gsol2, Print["sol are equal"], Print["sol are not equal"]]

```