

In[ ]:= **Remove["Global`\*"]**

checking answer to pb 2

In[ ]:= **sol1 = DSolve[{y'[x] - y[x] == 2 x \* Exp[2 x]}, y[x], x]**

Out[ ]:=  $\left\{ \left\{ y[x] \rightarrow 2 e^{2x} (-1 + x) + e^x c_1 \right\} \right\}$

In[ ]:= **sol = DSolve[{y'[x] - y[x] == 2 x \* Exp[2 x], y[0] == 1}, y[x], x]**

Out[ ]:=  $\left\{ \left\{ y[x] \rightarrow e^x (3 - 2 e^x + 2 e^x x) \right\} \right\}$

In[ ]:=  $\left\{ \left\{ y[x] \rightarrow e^x (3 - 2 e^x + 2 e^x x) \right\} \right\}$   
**y[x] /. sol[[1]]**

Out[ ]:=  $\left\{ \left\{ y[x] \rightarrow e^x (3 - 2 e^x + 2 e^x x) \right\} \right\}$

Out[ ]:=  $e^x (3 - 2 e^x + 2 e^x x)$

Pb 4 check

In[ ]:= **sol4 = DSolve[x^2 (y1''[x]) + 2 x (y1'[x]) - 1 == 0, y1[x], x]**

Out[ ]:=  $\left\{ \left\{ y1[x] \rightarrow -\frac{c_1}{x} + c_2 + \text{Log}[x] \right\} \right\}$

In[ ]:= **y1[x] /. sol4[[1]]**

Out[ ]:=  $-\frac{c_1}{x} + c_2 + \text{Log}[x]$

Pb 5

In[ ]:= **usol1 = DSolve[y2''[x] + y2'[x] - 2 y2[x] == 2 x, y2[x], x]**

Out[ ]:=  $\left\{ \left\{ y2[x] \rightarrow \frac{1}{2} \times (-1 - 2 x) + e^{-2x} c_1 + e^x c_2 \right\} \right\}$

In[ ]:= **usol = DSolve[{y2''[x] + y2'[x] - 2 y2[x] == 2 x, y2[0] == 0, y2'[0] == 1}, y2[x], x]**

Out[ ]:=  $\left\{ \left\{ y2[x] \rightarrow \frac{1}{2} e^{-2x} (-1 - e^{2x} + 2 e^{3x} - 2 e^{2x} x) \right\} \right\}$

test

In[ ]:= **Exp[-2 Log[x]]**

Out[ ]:=  $\frac{1}{x^2}$