```
In[•]:= Remove["Global`*"]
```

checking answer to pb 2

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

$$\text{Out[•]= } \left\{\left\{y[x] \to 2\, e^{2x}\, (-1+x) + e^{x}\, C_1\right\}\right\}$$

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

$$\text{Out[•]= } \left\{\left\{y[x] \to e^{x}\left(3 - 2\, e^{x} + 2\, e^{x} x\right)\right\}\right\}$$

```
In[•]:= {{y[x] → e^x (3 - 2 e^x + 2 e^x x)}}
        y[x] /. sol[[1]]
```

$$\text{Out[•]= } \left\{\left\{y[x] \to e^{x}\left(3 - 2\, e^{x} + 2\, e^{x} x\right)\right\}\right\}$$

$$\text{Out[•]= } e^{x}\left(3 - 2\, e^{x} + 2\, e^{x} x\right)$$

Pb 4 check

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

$$\text{Out[•]= } \left\{\left\{y1[x] \to -\frac{C_1}{x} + C_2 + \text{Log}[x]\right\}\right\}$$

```
In[•]:= y1[x] /. sol4[[1]]
```

$$\text{Out[•]= } -\frac{C_1}{x} + C_2 + \text{Log}[x]$$

Pb 5

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

$$\text{Out[•]= } \left\{\left\{y2[x] \to \frac{1}{2} \times (-1-2x) + e^{-2x}\, C_1 + e^{x}\, C_2\right\}\right\}$$

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

$$\text{Out[•]= } \left\{\left\{y2[x] \to \frac{1}{2}\, e^{-2x}\left(-1 - e^{2x} + 2\, e^{3x} - 2\, e^{2x} x\right)\right\}\right\}$$

test

```
In[•]:= Exp[-2 Log[x]]
```

$$\text{Out[•]= } \frac{1}{x^2}$$