```
y = 1 + x + Sum[a[i] x^i, {i, 2, 5}] + O[x]^6
```

$$1 + x + a[2]\, x^2 + a[3]\, x^3 + a[4]\, x^4 + a[5]\, x^5 + O[x]^6$$

```
D[y, x, x] + 3 x D[y, x] + 2 y == 0
```

$$(2 + 2\, a[2]) + (5 + 6\, a[3])\, x + (8\, a[2] + 12\, a[4])\, x^2 + (11\, a[3] + 20\, a[5])\, x^3 + O[x]^4 == 0$$

```
LogicalExpand[%]
```

$$2 + 2\, a[2] == 0 \&\& 5 + 6\, a[3] == 0 \&\& 8\, a[2] + 12\, a[4] == 0 \&\& 11\, a[3] + 20\, a[5] == 0$$

```
Solve[%]
```

$$\left\{\left\{a[2] \to -1,\ a[3] \to -\frac{5}{6},\ a[4] \to \frac{2}{3},\ a[5] \to \frac{11}{24}\right\}\right\}$$

```
// Then I clicked on "apply rules to expression"
// and put y = 1 + x + Sum[a[i] x^i, {i, 2, 5}] in the box.
// Also I added x → 0.5 to make it also evaluate for x = 0.5.


1 + x + x^2 a[2] + x^3 a[3] + x^4 a[4] + x^5 a[5] /.
  {{a[2] → -1, a[3] → -5/6, a[4] → 2/3, a[5] → 11/24, x → 0.5}}
{1.20182}

// Now to compare with the book ' s answer :

In[84]:= N[923 / 768]
Out[84]= 1.20182

In[87]:= Plot[1 + x + x^2 a[2] + x^3 a[3] + x^4 a[4] + x^5 a[5] /.
    {{a[2] → -1, a[3] → -5/6, a[4] → 2/3, a[5] → 11/24, x → 0.5}}, {x, 0, 1}]
```

Out[87]=