- Problem: Solve:

$$y\,\frac{d^2 y}{d x^2} + 5\,y = x^2$$ with conditions $y(0) = 1$ and $y'(0) = 0.$ Our values for $x$ are from $x = 0$ to $x = 10$.

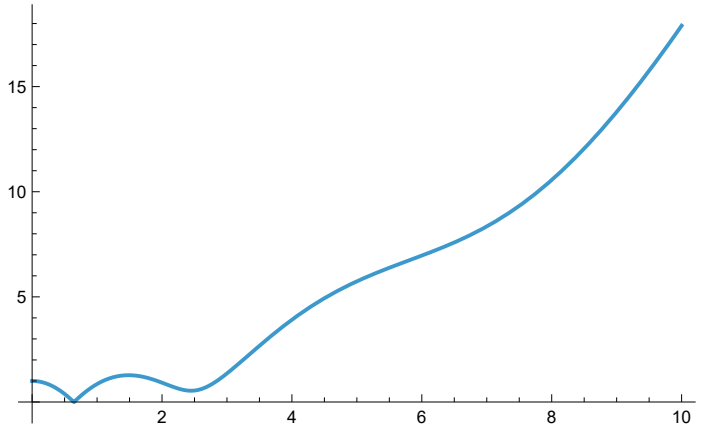
In[•]:=
```
NDSolve[{y[x] * y''[x] + 5 y[x] == x^2,
  y[0] == 1, y'[0] == 0}, y, {x, 0, 10}]
```

Out[•]=

$$\{\{y \to \text{InterpolatingFunction}[\ \text{Domain: } \{\{0., 10.\}\}\ \text{Output: scalar}\ ]\}\}$$

In[•]:=
```
sol = NDSolve[{y[x] * y''[x] + 5 y[x] == x^2,
    y[0] == 1, y'[0] == 0}, y, {x, 0, 10}];
Plot[y[x] /. sol, {x, 0, 10}]
```

Out[•]=




- Our values for $y$'s from $x$= 0 to $x$ =10:

In[1]:=
```
sol = NDSolve[{y[x] × y''[x] + 5 y[x] == x^2,
    y[0] == 1, y'[0] == 0}, y, {x, 0, 10}];
Table[{x, y[x] /. sol}, {x, 0, 10, 1}] // TableForm
```

Out[2]//TableForm=

| | |
|---|---|
| 0 | 1. |
| 1 | 0.854627 |
| 2 | 0.918561 |
| 3 | 1.35745 |
| 4 | 3.91322 |
| 5 | 5.73897 |
| 6 | 6.96431 |
| 7 | 8.34877 |
| 8 | 10.5573 |
| 9 | 13.7955 |
| 10 | 17.8982 |