- Find the solutions of $\left(\frac{dy}{dx}\right)^2 + y = x^2$ with intial value $y(0) = 0$

In[•]:=
```
NDSolve[{(y'[x])^2 + y[x] == x^2, y[0] == 0},
 y, {x, -10, 10}]
```

Out[•]=

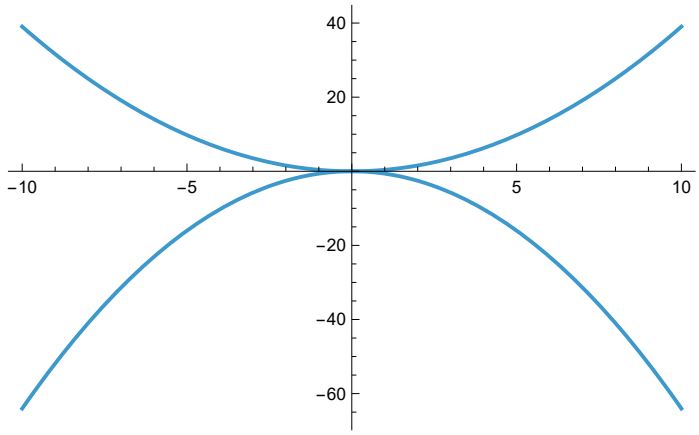
$$\left\{\left\{y \to \texttt{InterpolatingFunction}\left[\right.\right.\right.$$

$$\left.\left.\left.\right]\right\}, \left\{y \to \texttt{InterpolatingFunction}\left[\right.\right.\right.$$

$$\left.\left.\left.\right]\right\}\right\}$$

In[•]:=
```
Plot[y[x] /. %, {x, -10, 10}]
```

Out[•]=



```
In[•]:= sol = NDSolve[{(y'[x])^2 + y[x] == x^2, y[0] == 0},
    y, {x, -10, 10}];

  Table[{x, y[x] /. sol[[1]]},
    {x, -10, 10, 1}] // TableForm
```

Out[•]//TableForm=

−10	39.0388
−9	31.6214
−8	24.9848
−7	19.129
−6	14.054
−5	9.75971
−4	6.24621
−3	3.51349
−2	1.56155
−1	0.390388
0	0.
1	−0.640388
2	−2.56155
3	−5.76349
4	−10.2462
5	−16.0097
6	−23.054
7	−31.379
8	−40.9848
9	−51.8714
10	−64.0388

In[•]:=
```
Grid[Table[{x, y[x] /. sol[[1]]}, {x, -10, 10, 1}], Frame → All]
```

Out[•]=

−10	39.0388
−9	31.6214
−8	24.9848
−7	19.129
−6	14.054
−5	9.75971
−4	6.24621
−3	3.51349
−2	1.56155
−1	0.390388
0	0.
1	−0.640388
2	−2.56155
3	−5.76349
4	−10.2462
5	−16.0097
6	−23.054
7	−31.379
8	−40.9848
9	−51.8714
10	−64.0388

```
In[•]:= sol = NDSolve[{(y'[x])^2 + y[x] == x^2, y[0] == 0},
    y, {x, -10, 10}];

  Table[{x, Abs[y[x] /. sol[[1]]]},
    {x, -10, 10, 1}] // TableForm
```

Out[•]//TableForm=

−10	39.0388
−9	31.6214
−8	24.9848
−7	19.129
−6	14.054
−5	9.75971
−4	6.24621
−3	3.51349
−2	1.56155
−1	0.390388
0	0.
1	0.640388
2	2.56155
3	5.76349
4	10.2462
5	16.0097
6	23.054
7	31.379
8	40.9848
9	51.8714
10	64.0388