Week 10 - Manipulate

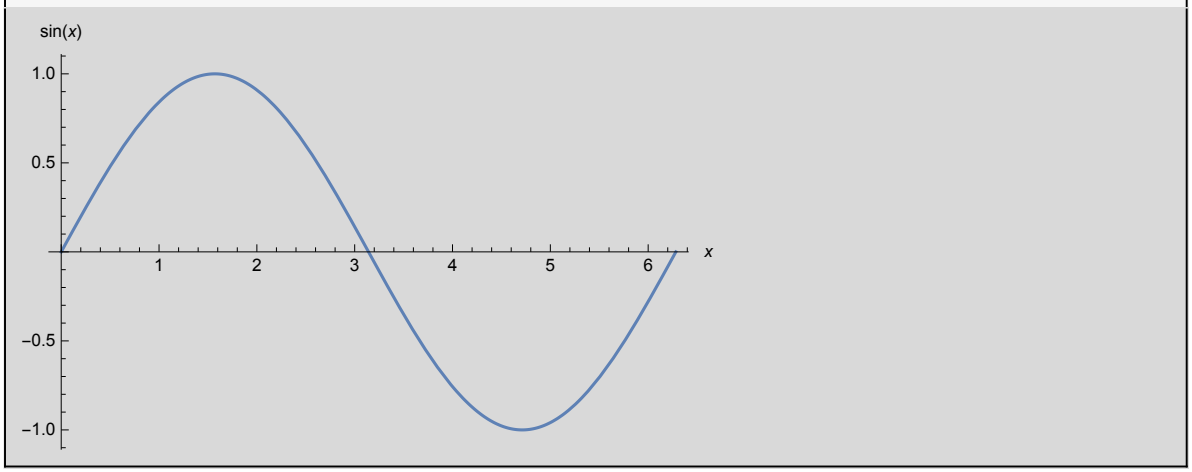
Review

> DSolve[differential equation, y[x], x]
> DSolve[{differential equation, initial conditions}, y[x], x]
> Difference between '=' and '=='
> Remove[y]

Manipulate - interactive plots

In[1]:=
```
Plot[Sin[x], {x, 0, 2 π}, AxesLabel → {x, Sin[x]}]
```

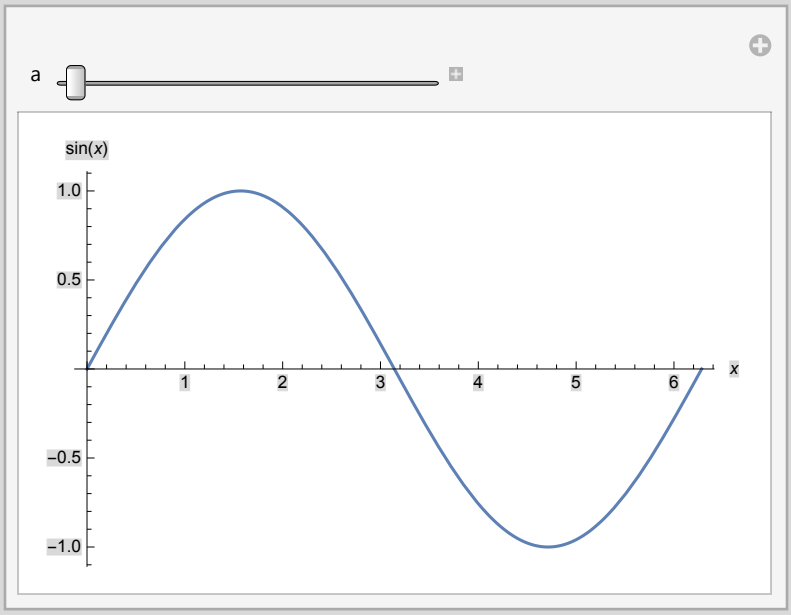
Out[1]=



In[2]:=
```
Manipulate[expression that is dependent on a varialbe, {variable, min, max}]
```

In[3]:=
```
Manipulate[Plot[Sin[a * x], {x, 0, 2 π}, AxesLabel → {x, Sin[x]}], {a, 1, 5}]
```

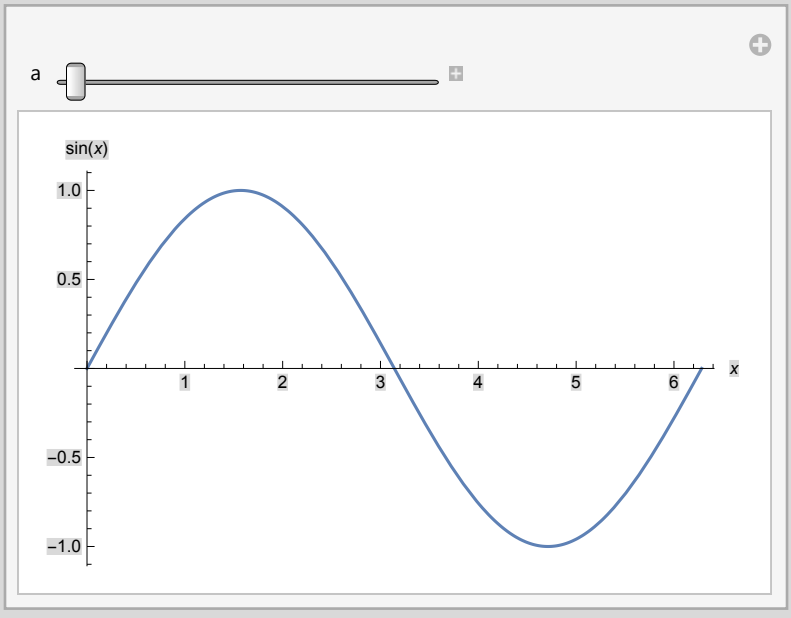
Out[3]=



In[4]:=
```
function1[a_] := Plot[Sin[a * x], {x, 0, 2 π}, AxesLabel → {x, Sin[x]}]
```

In[5]:=
```
Manipulate[function1[a], {a, 1, 5}]
```

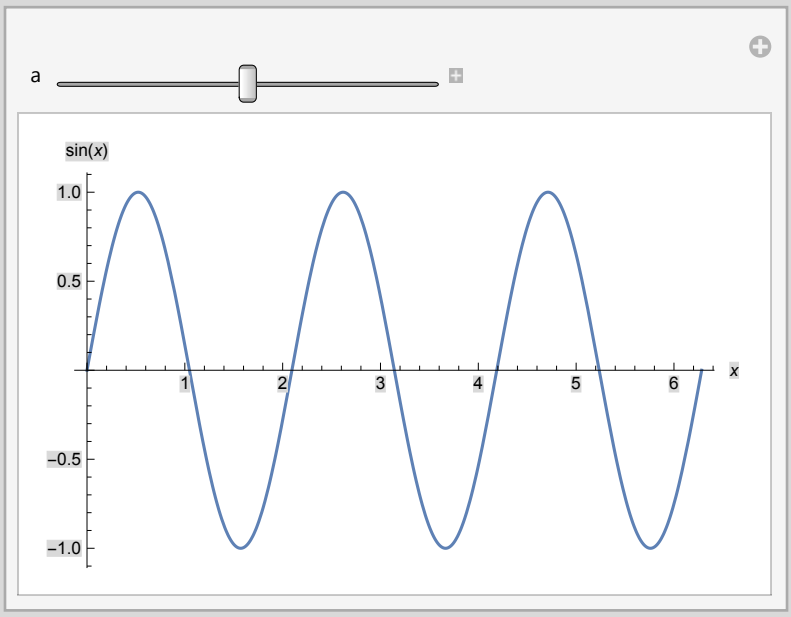
Out[5]=



Setting initial value

In[6]:=
```
Manipulate[function1[a], {{a, 3}, 1, 5}]
```

Out[6]=



Curly brackets to add information

Integration

In[7]:=
```
Integrate[x^2, x]
```

Out[7]=
$$\frac{x^3}{3}$$

In[8]:=
```
Integrate[x^2, {x, 0, 5}]
```

Out[8]=
$$\frac{125}{3}$$

Differential Equations

In[9]:=
```
DSolve[y'[x] == y[x] / x, y[x], x]
```

Out[9]=
```
{{y[x] → x C[1]}}
```

In[10]:=
```
DSolve[{y'[x] == y[x] / x, y[1] == 1}, y[x], x]
```

Out[10]=
```
{{y[x] → x}}
```

Colour change

Summary

1. Manipulate[function[a], {a, min, max}]
2. Manipulate[function[a], {{a, starting value}, min, max}]

3. Curly brackets can be added to give more information.