

An example of Lagrange Interpolation with $n=4$

The x_j will be $x_1=2, x_2=4, x_3=6,$ and $x_4=9$

Now for the a_j . They will be $a_1=3, a_2=5, a_3=7, a_4=8$.

```
In[1]:= g1[x_] := (x - 4) (x - 6) (x - 9) / ((2 - 4) (2 - 6) (2 - 9))
```

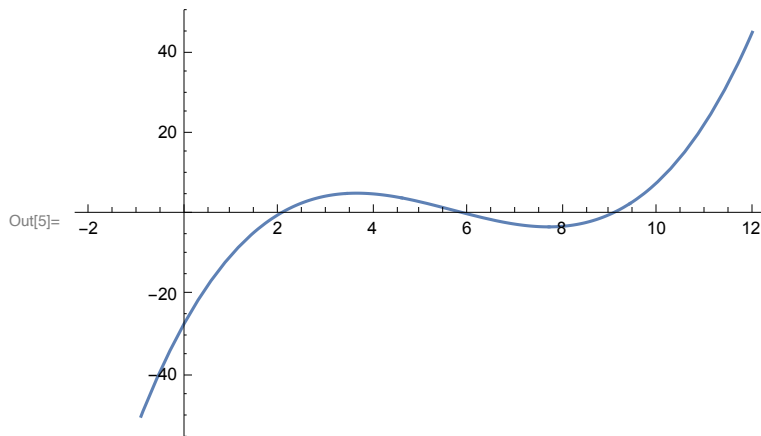
```
In[2]:= g2[x_] := (x - 2) (x - 6) (x - 9) / ((4 - 2) (4 - 6) (4 - 9))
```

```
In[3]:= g3[x_] := (x - 2) (x - 4) (x - 9) / ((6 - 2) (6 - 4) (6 - 9))
```

```
In[4]:= g4[x_] := (x - 2) (x - 4) (x - 6) / ((9 - 2) (9 - 4) (9 - 6))
```

As an example, plot $a_2 g_2(x)$:

```
In[5]:= Plot[5 g2[x], {x, -2, 12}]
```



It vanishes at $x=2, 6,$ and $9,$ and it is 5 at $x=4$.

Now plot the whole Lagrange interpolation:

```
In[6]:= Plot[3 g1[x] + 5 g2[x] + 7 g3[x] + 8 g4[x], {x, -2, 12}]
```

