In[43]:=
```
SetOptions[SelectedNotebook[],
 PrintingStyleEnvironment → "Printout", ShowSyntaxStyles → True]
```

In[44]:=
```
V0 = 10.; a = 0.5; L = 1.;
n = 11;
ϕ[k_?NumericQ] := If[OddQ[k], Cos[k π x / (2 L)], Sin[k π x / (2 L)]]
```

In[47]:=
```
H = Quiet@ParallelTable[If[k1 == k2, k1^2 π^2 / 8, 0] +
    V0 Quiet@NIntegrate[ϕ[k1] × ϕ[k2], {x, -a, a}, AccuracyGoal → 4], {k1,
    1, n}, {k2, 1, n}];
```

In[48]:=
```
H // MatrixForm;
{λ, ψ} = Eigensystem[H];
Reverse@Take[λ, -4]
```

Out[50]=
```
{7.76594, 8.75999, 16.1812, 25.6011}
```

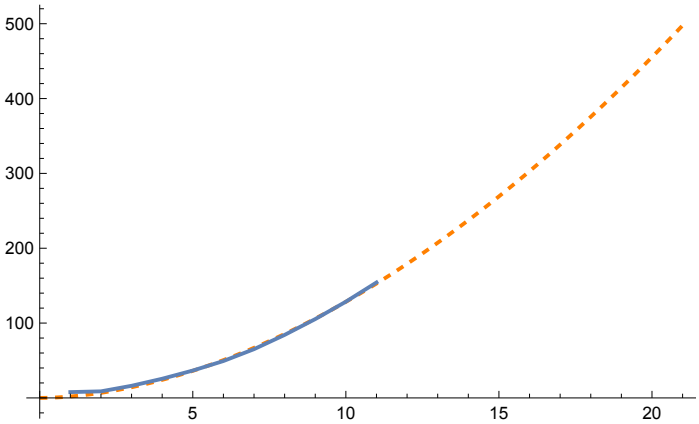
In[51]:=
```
ξ = NonlinearModelFit[Reverse@λ, k x^b, {k, b}, x];
ξ["ParameterTable"]
```

Out[52]=

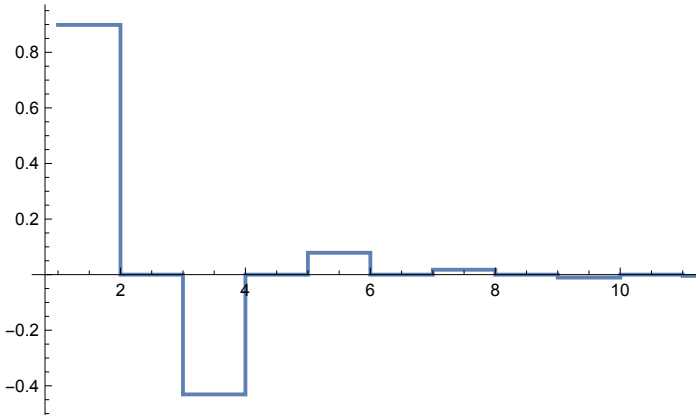
	Estimate	Standard Error	t-Statistic	P-Value	
k	1.91432	0.18677	10.2496	2.91328	$\times 10^{-6}$
b	1.82647	0.0436527	41.8411	1.26863	$\times 10^{-11}$

In[53]:=
```
Show[Plot[ξ["BestFit"], {x, 0, n + 10}, PlotStyle → {Dashed, Orange}],
 ListLinePlot[Reverse@λ, ImageSize → Medium]]
ListStepPlot[Last@ψ, PlotRange → Full, ImageSize → Medium]
```

Out[53]=



Out[54]=



In[67]:=
```
Ψ = #.Table[ϕ[k], {k, 1, n}] & /@ ψ;
With[{ξ = Take[Ψ, -5]}, Plot[ξ, {x, -L, L}]]
```

Out[68]=