In[28]:=
```
n = 20; (*dimension of the matrix*)
A = RandomReal[{-1, 1}, {n, n}]; (*random n x n matrix with entries between-1 and 1*)
B = A.Transpose[A]; (*symmetric positive-definite matrix*)
```

In[32]:=
```
w = RandomReal[{-1, 1}, n]
```

Out[32]=
```
{-0.444352, -0.265157, 0.513388, -0.46071, 0.815545, -0.862734,
 -0.950747, 0.605277, 0.543393, 0.985777, -0.0868528, 0.0867801, 0.746262,
 0.541047, -0.412004, 0.255414, 0.564723, 0.769283, 0.741201, 0.515566}
```

In[34]:=
```
Bw = DiagonalMatrix[w].B.DiagonalMatrix[w];
```

In[35]:=
```
eigw = Eigenvalues[Bw]
```

Out[35]=
```
{11.0584, 9.13737, 8.75294, 5.65107, 4.91739, 3.17143, 2.43112,
 2.13464, 1.46681, 1.28776, 0.729771, 0.592334, 0.371445, 0.29246,
 0.224183, 0.130627, 0.0976522, 0.00483116, 0.00247887, 0.0000210531}
```

In[36]:=
$$\frac{\text{Total}[\text{eigw}]^2}{\text{Total}\left[\text{eigw}^2\right]}$$

Out[36]=
```
7.55849
```

In[38]:=
```
varw = w.B.w
```

Out[38]=
```
39.8586
```

In[57]:=
```
strategy = {3, 7, 8, 15, 17};
```

In[40]:=
```
w[[strategy]]
```

Out[40]=
```
{-0.444352, 0.513388, -0.950747}
```

In[41]:=
```
ww = w
```

Out[41]=
```
{-0.444352, -0.265157, 0.513388, -0.46071, 0.815545, -0.862734,
 -0.950747, 0.605277, 0.543393, 0.985777, -0.0868528, 0.0867801, 0.746262,
 0.541047, -0.412004, 0.255414, 0.564723, 0.769283, 0.741201, 0.515566}
```

In[42]:=
```
ww[[strategy]] *= 0.1
```

Out[42]=
```
{-0.0444352, 0.0513388, -0.0950747}
```

In[44]:=
```
MapAt[0.1 # &, w, List /@ strategy]
```

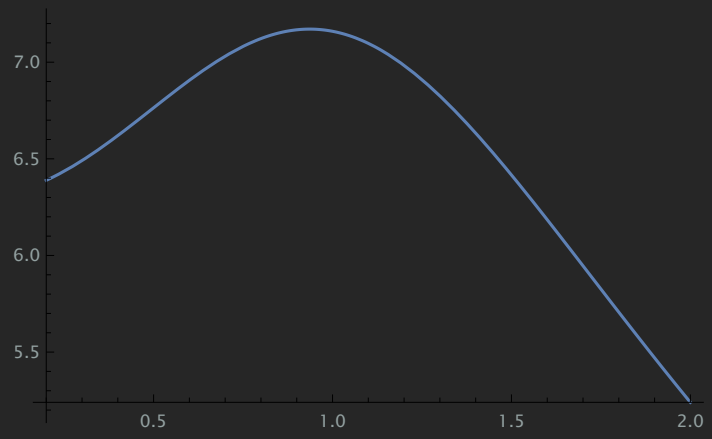
Out[44]=
```
{-0.0444352, -0.265157, 0.0513388, -0.46071, 0.815545, -0.862734,
 -0.0950747, 0.605277, 0.543393, 0.985777, -0.0868528, 0.0867801, 0.746262,
 0.541047, -0.412004, 0.255414, 0.564723, 0.769283, 0.741201, 0.515566}
```

Given scaler, get value of objective function:

In[53]:=
```
ff[x_, g_] := Module[{ww = MapAt[x # &, w, List /@ strategy], eig},
  eig = Eigenvalues[DiagonalMatrix[ww].B.DiagonalMatrix[ww]];
  Total[eig]^2/Total[eig^2] - g (ww.B.ww)]
```

In[62]:=
```
Plot[ff[x, 0.01], {x, 0.2, 2.}]
```

Out[62]=



In[48]:=
```
Plot[ff[x, 0], {x, 0.2, 2.}]
```

Out[48]=