

Linear chain of balls + springs, 2 different atoms

In[16]:= m1 = 3; m2 = 1; c = 1; a = 1;

In[17]:= w1[k_] = Sqrt[2 c (m1 + m2) + Sqrt[4 c^2 (m1 + m2)^2 - 4 (m1 m2) (2 c^2 (1 - Cos[k a]))]]

Out[17]= $\sqrt{8 + \sqrt{64 - 24 (1 - \cos[k])}}$

In[18]:= w2[k_] = Sqrt[2 c (m1 + m2) - Sqrt[4 c^2 (m1 + m2)^2 - 4 (m1 m2) (2 c^2 (1 - Cos[k a]))]]

Out[18]= $\sqrt{8 - \sqrt{64 - 24 (1 - \cos[k])}}$

In[19]:= Plot[{w1[k], w2[k]}, {k, -Pi, Pi}]

