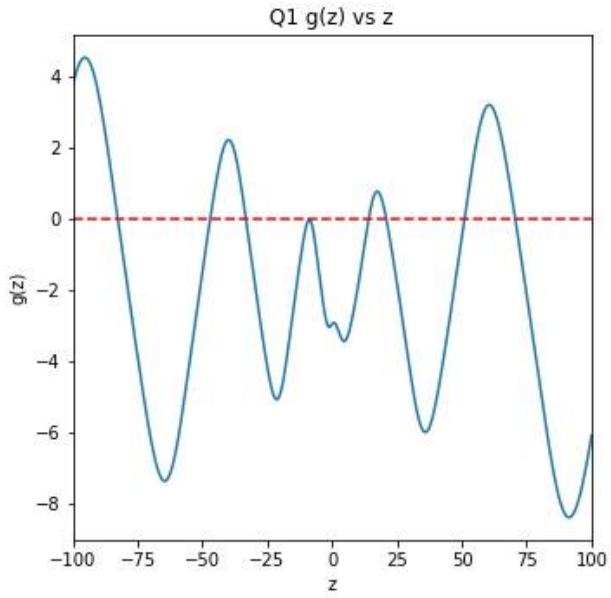
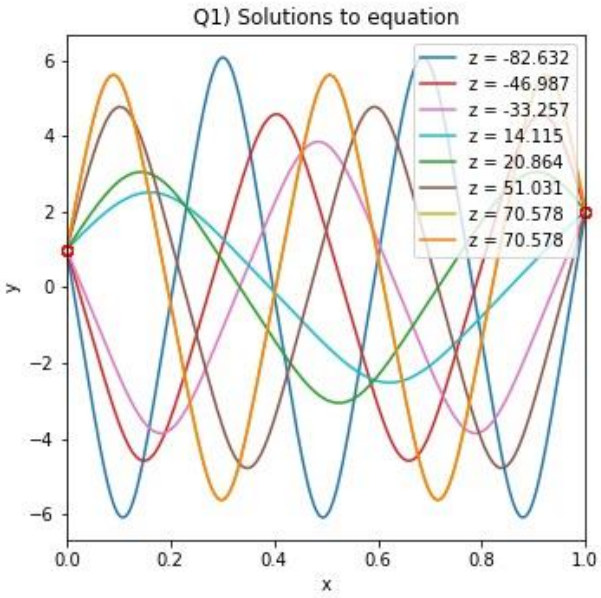
Phys 305 HW 5
Christopher Morris

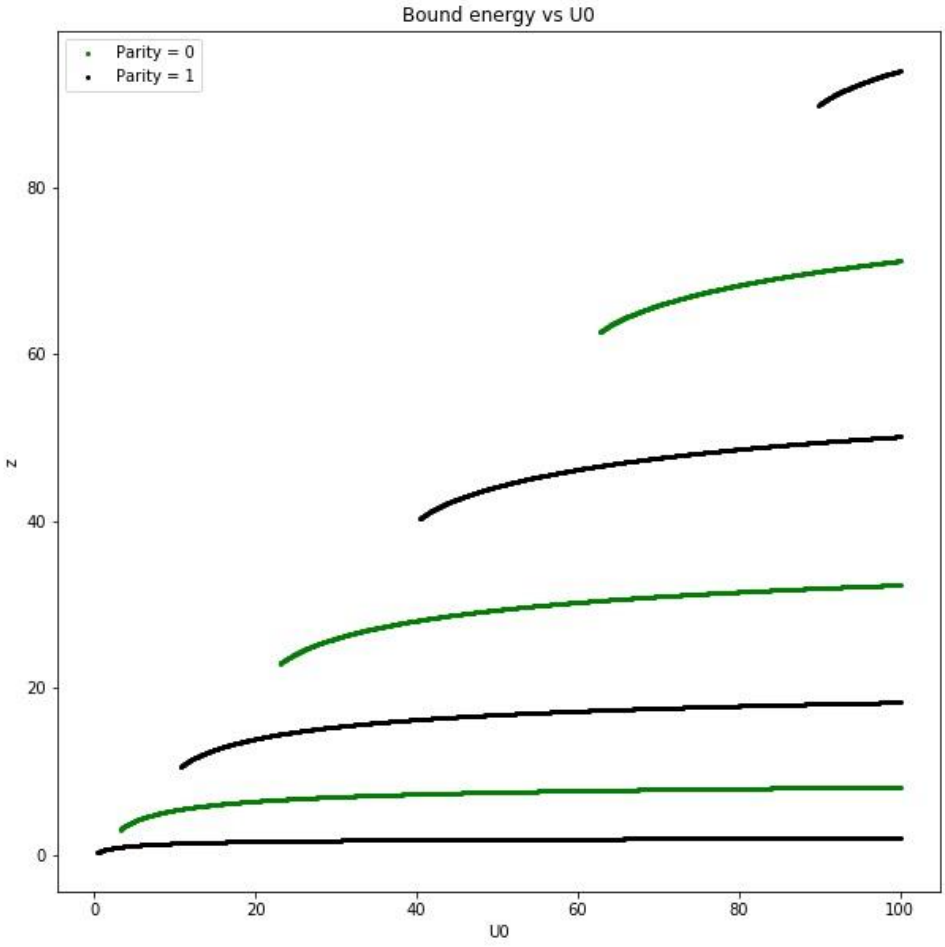
1)






```
Root at = -82.63173243106135
Root at = -46.987081631668495
Root at = -33.257474369147985
Root at = 14.11540741190338
Root at = 20.863833750358022
Root at = 51.030621219548046
Root at = 70.578037319942
```

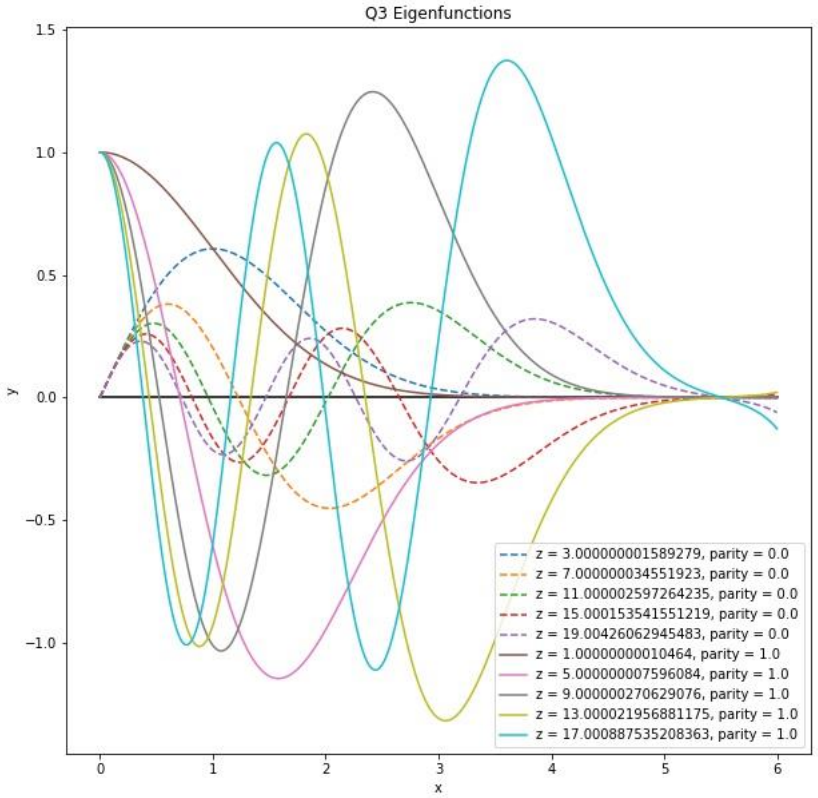
2)



3)

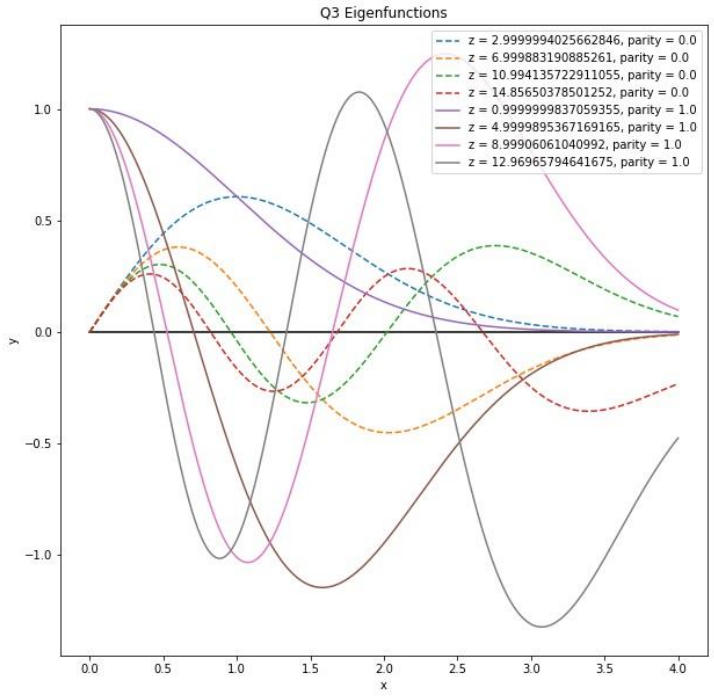
For x0 = 6

```
z = 3.000000001589279 g(z) = 5.284985469655029e-09 With Parity =  0.0
z = 7.000000034551923 g(z) = -1.6608170567977698e-10 With Parity =  0.0
z = 11.000002597264235 g(z) = 1.3961250558414129e-11 With Parity =  0.0
z = 15.000153541551219 g(z) = -1.1712436576161167e-12 With Parity =  0.0
z = 19.00426062945483 g(z) = 1.9600987499757139e-13 With Parity =  0.0
z = 1.00000000010464 g(z) = 2.595874790355949e-08 With Parity =  1.0
z = 5.000000007596084 g(z) = -7.407226479318879e-10 With Parity =  1.0
z = 9.000000270629076 g(z) = 8.957972384704416e-11 With Parity =  1.0
z = 13.000021956881175 g(z) = -3.44972661547871e-12 With Parity =  1.0
z = 17.000887535208363 g(z) = 2.1151969065158482e-12 With Parity =  1.0
```



For x0 = 4

```
z = 2.9999994025662846 g(z) = -2.1795505504573764e-11 With Parity =  0.0
z = 6.999883190885261 g(z) = 2.6444957335058916e-12 With Parity =  0.0
z = 10.994135722911055 g(z) = -5.3818061118704463e-14 With Parity =  0.0
z = 14.85650378501252 g(z) = 2.1010970741031088e-14 With Parity =  0.0
z = 0.9999999837059355 g(z) = -1.593461274387864e-10 With Parity =  1.0
z = 4.9999895367169165 g(z) = 1.6979612160739066e-12 With Parity =  1.0
z = 8.99906061040992 g(z) = -2.769451334927453e-13 With Parity =  1.0
z = 12.96965794641675 g(z) = 3.9668268669856843e-13 With Parity =  1.0
```



Discussion:

The number of eigenvalues decreased by 2 (one for each parity). The eigenvalues essentially remained the same; however, the greatest most eigenvalues were no longer solutions. The Eigen functions of the remaining eigenvalues essentially remain the same.

4)

```
z = -0.05794119998551664 g(z) = 3.592911172779767e-07 With Parity =  0.0
z = -0.30056741482884836 g(z) = 2.7402384781025e-05 With Parity =  1.0
z = -0.019991071771046025 g(z) = -3.2706197278242755e-08 With Parity =  1.0
```