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 1: import numpy as np
 2: import math
 3: import pylab
 4:
 5: G = 6.674e-11
 6: M=5.974e24
 7: m=7.348e22
 8: R=3.844e8
 9: w=2.662e-6
10:
11: def Newtons(func, x_init, delta=1e-4):
12:     x = x_init
13:     # h = 0.5
14:     # df = lambda x: (func(x + h) - func(x - h)) / (2 * h)
15:     df = lambda x: -2*G*M/x**3-2*G*m/(R-x)**3-w**2
16:     while np.fabs(x) > delta:
17:         x -=  (func(x)/ df(x))
18:     return x
19:
20: def main():
21:     func = lambda r: (G*M/r**2)-(G*m/(R-r)**2)-(w**2*r)
22:     approx = Newtons(func, R/2)
23:     print("r \u2245 {:e}m".format(approx))
24:
25: if __name__ == "__main__":
26:     main()
```