1) The period is given by: $T=2\pi\sqrt{\frac{L}{g}}$

2) Divide by 2π on both sides:

$$\frac{T}{2\pi}=\frac{2\pi}{2\pi}\sqrt{\frac{L}{g}} \qquad \Rightarrow \qquad \frac{T}{2\pi}=\sqrt{\frac{L}{g}}$$

3) Square both sides:

$$\left(\frac{T}{2\pi}\right)^2=\frac{L}{g} \qquad \Rightarrow \qquad \frac{T^2}{4\pi^2}=\frac{L}{g}$$

4) Flip the equation to isolate and multiply both sides by L

$$\frac{4\pi^2}{T^2}=\frac{g}{L} \qquad \Rightarrow \qquad g=\frac{4\pi^2}{T^2}L$$

5) g is also given by $g=\frac{GM}{r^2}$, so you can set this g equal to the one from above

$$\frac{GM}{r^2}=\frac{4\pi^2}{T^2}L$$

6) Now multiply both sides by r^2 and then divide by big G

$$M=\frac{4\pi^2}{T^2}L\left(\frac{r^2}{G}\right)$$

7) Now you can plug in the information given.

8) If r=7550 km, T=10 seconds, L=0.5 meters, you get $M=\frac{4\pi^2}{10^2}(.5)\left(\frac{(7550\times1000)^2}{6.67\times10^{-11}}\right)=1.687\times10^{23}$ kg