Answer on Question #43414, Physics, Other

Task: On a trip to the Moon you swing a pail of moon-dust in a vertical circle which has a radius of .850 m. At the top of the circle, the tension in the rope on which the pail is swinging exerts a force equal to twice the force of the Moon's gravity on the pail. If the speed of the pail at the top of the loop is 2.03 m/s, then the acceleration due to gravity on the Moon is?

Solution:

Centripetal force $F_c = \frac{mv^2}{r} =$ twice the force of the Moon's gravity on the pail

g_m - Acceleration

$$\frac{mv^2}{r} = 2mg_m \Rightarrow g_m = \frac{v^2}{2r} = \frac{2.03^2}{2 \cdot 0.85} \approx 2.42 m/s^2$$