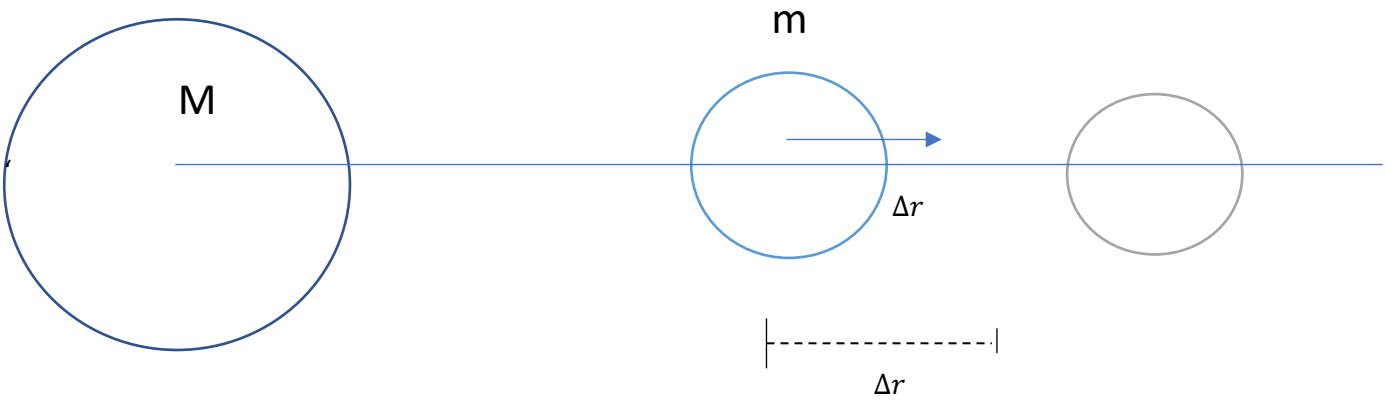
Energiforhold i et gravitationsfelt



$G = 6{,}6726 \cdot 10^{-11} \frac{N \cdot m^2}{kg^2}$

$F_g = G \cdot \frac{M \cdot m}{r^2}$

$E_{mek} = E_{pot} + E_{kin}$

$E_{kin} = \frac{1}{2} \cdot m \cdot v^2$

$E_{pot} = ?$

$\Delta r \ll r \quad \Delta r + r \approx r \quad F_g = konstant$

$A_{felt} = -\Delta E_{pot} \quad (konservativ\ kraft)$

$A_{felt} = \vec{F} \cdot \overrightarrow{\Delta r} = F \cdot \Delta r \cdot cos(\theta)$

$= F \cdot \Delta r \cdot \cos(180)$

$= -F \cdot \Delta r$

$= -G \cdot (M \cdot m)/r\hat{}2 \cdot \Delta r$

$-\Delta E_{pot}$ =A_felt

$-\Delta E_{pot} = -G \cdot \frac{M \cdot m}{r^2} \cdot \Delta r$

$\frac{\Delta E_{pot}}{\Delta r} = G \cdot \frac{M \cdot m}{r^2}$

$\Delta r \to 0$

$E\_pot\hat{}'(r) = G \cdot \frac{M \cdot m}{r^2}$

$E\_pot(r) = -G \cdot \frac{M \cdot m}{r} + k$

$E\_pot(\infty) = -G \cdot \frac{M \cdot m}{\infty} + k$

$k = 0$

$E_{pot}(r) = -G \cdot \frac{M \cdot m}{r}$