Circular motion and gravitation

uniform circular motion: speed const., but direction constantly changing

centripetal acceleration — centripetal force (no work done ⇒ no movement in direction of F)

$$a_c = \frac{v^2}{r} = r \cdot \omega^2$$

$$F_c = \frac{m \cdot v^2}{r} = m \cdot r \cdot \omega^2$$

angular velocity $\omega_{avg.} = \frac{\Delta\theta}{\Delta t}$ (angle turned per time)

$\omega \cdot T = 2\pi$ (full circle in T)

$$\omega = \frac{2\pi}{T}$$

Newton's law of universal gravitation: $F_G = G \cdot \frac{m_1 \cdot m_2}{r^2}$

gravitational field strength $g = \frac{F}{m}$

(think of $E = \frac{F}{q}$)

G ↑ gravitational const. $6{,}67 \cdot 10^{-11}\ N \cdot m^2 \cdot kg^{-2}$