# Planet definition: round or not?

Class 1

Quaoar radius ~ 500 km
Ceres radius ~ 450 km } round
Vesta ~ 250 km → not round

Mass $M$
Radius $R$
Density $\rho$

gravity $g = -\frac{GM}{R^2} = -\frac{4}{3}\pi G \bar{\rho} R$

Topography → $h$

strength

weight: $\sigma = \rho_c g h$ $\quad$ $Y \sim \sigma = \frac{4}{3}\pi G \bar{\rho} \rho_c R h$ $\quad$ (Solve for $h$)

$h \sim Y \cdot \frac{3}{4\pi G \bar{\rho} \rho_c R}$

$Y \sim 10$ MPa
$\rho \sim 1$ g/cm$^3$ (1000 kg/m$^3$)

$h \sim 0.5R$ (crude estimate)

$R^2 \sim \frac{10 \cdot 10^6 \cdot 3}{4\pi G \cdot 10^3}$ m$^2$

Granite → $Y \sim 100$ MPa

$R \sim 250$ km

$R \sim 800$ km

Boundary.
Highlight that it varies with composition.