

$$F = G \frac{mM}{R^2}$$

$$\underline{R^2} \cdot F = G \frac{mM}{\underline{R^2}} \cdot \underline{R^2}$$

$$R^2 F = G m M$$

$$\frac{R^2 F}{\underline{m M}} = G \frac{\underline{m M}}{\underline{m M}}$$

$$\frac{R^2 F}{m M} = G \quad \checkmark$$