

2)

$$F = G \cdot \boxed{\frac{m \cdot M}{d^2}}$$

$$F \cdot X = \frac{F}{G} \cdot G \cdot X \\ = \frac{F \cdot G \cdot X}{G}$$

$$F = G \cdot X$$

\downarrow

$$\frac{F}{G} = X$$

$$\begin{array}{c|c} F & G \cdot X \\ \hline \frac{F}{G} & X \end{array}$$

$$\frac{F}{G} = \boxed{\frac{m \cdot M}{d^2}}$$

$$\Rightarrow \frac{F}{G} = \boxed{\frac{m \cdot M}{d^2}}$$

$$\Rightarrow \frac{F}{G} = Y$$

$$\begin{array}{c|c} F & Y \\ \hline \frac{F}{G} & d^2 \end{array}$$

$$\Rightarrow Y = \frac{F \cdot d^2}{G}$$

$$\frac{F \cdot d^2}{G} = Y$$

$$\Rightarrow \boxed{m \cdot M} = \frac{F \cdot d^2}{G}$$

$$\Rightarrow m = \frac{\frac{F \cdot d^2}{G}}{M} \quad \div M$$

$$\Leftrightarrow m = \frac{F \cdot d^2}{G} \cdot \frac{1}{M} = \frac{F \cdot d^2}{G \cdot M}$$

$$\Rightarrow \boxed{m = \frac{F \cdot d^2}{G \cdot M}}$$

$$b) \quad F = G \cdot \frac{m \cdot M}{d^2}$$

$$\Leftrightarrow \frac{F}{G} = \frac{m \cdot M}{d^2}$$

$$\Leftrightarrow \frac{d^2}{G} = \frac{m \cdot M}{F}$$

$$\Leftrightarrow d^2 = \frac{m \cdot M}{F} \cdot G$$

$$\Leftrightarrow d = \sqrt{\frac{m \cdot M}{F} \cdot G}$$

