

Gravitational Acceleration Calculations

Solve for the gravitational acceleration on **at least 3 planets** in our

solar system. using the formula
$$\mathbf{g} = \frac{\mathbf{G} \cdot \mathbf{M}}{\mathbf{r}^2}$$

Planet	Mass (kg)	Radius (m)
Mercury	$3.29 \cdot 10^{23}$	$2.42 \cdot 10^6$
Venus	$4.90 \cdot 10^{24}$	$6.06 \cdot 10^6$
Earth	$5.98 \cdot 10^{24}$	$6.38 \cdot 10^6$
Moon	$7.38 \cdot 10^{22}$	$1.74 \cdot 10^6$
Mars	$6.58 \cdot 10^{23}$	$3.38 \cdot 10^6$
Jupiter	$1.90 \cdot 10^{27}$	$7.14 \cdot 10^7$
Saturn	$5.69 \cdot 10^{26}$	$6.03 \cdot 10^7$
Uranus	$8.69 \cdot 10^{25}$	$2.56 \cdot 10^7$
Neptune	$1.02 \cdot 10^{26}$	$2.48 \cdot 10^7$
Pluto	$1.32 \cdot 10^{22}$	$1.15 \cdot 10^6$

$$\mathbf{G} = 6.67 \cdot 10^{-11} \frac{\mathbf{N} \cdot \mathbf{m}^2}{\mathbf{kg}^2}$$

ANSWER THE FOLLOWING QUESTIONS:

1. If the mass of a planet doubled (without changing size), how would its gravitational acceleration change?
2. If the radius of a planet doubled (without changing mass), how would its gravitational acceleration change?
3. Does gravitational acceleration (g) depend on the mass of the object that is accelerating? Explain.
4. How does the gravitational acceleration change when moving three times farther out from a planet?