

NAME: _____

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WEIGHT AND MASS CALCULATIONS

Mass can be used to calculate weight using the following equation:

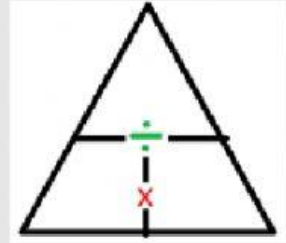
WEIGHT = MASS X ACCELERATION DUE TO GRAVITY

$$W = m \times g$$

The unit of measurement for Weight is N (Newton), for mass it is kg and acceleration due to gravity is ms⁻².

Complete the triangle to the right using W, m and g.

(Remember to put in the equation, plug in the numbers, then the answer with units.)

Answers to 1 decimal place where applicable.

$m = 20\text{kg}$
 $g = 34 \text{ m/s}^2$
 _____ N

A

$m = 11\text{kg}$
 $g = 3 \text{ m/s}^2$
 _____ N

B

$m = 45\text{kg}$
 $g = 9 \text{ m/s}^2$
 _____ N

C

$m = 89 \text{ kg}$
 $g = 12 \text{ m/s}^2$
 _____ N

D1a. Calculate the weight of a man of 250kg on a planet where the gravity is 67ms^{-2} .

Weight = _____ X _____

= _____ kg x _____ ms^{-2}

= _____ N

b. Calculate the weight of a man of 345 kg on a planet where the gravity is 4.2ms^{-2} .

Weight = _____ X _____

= _____ kg x _____ ms^{-2}

= _____ N

c. Calculate the weight of a man on a moon which has a gravitational pull of 19.34 ms^{-2} if his mass is 56kg.

$$\begin{aligned}\text{Weight} &= \underline{\hspace{2cm}} \times \underline{\hspace{2cm}} \\ &= \underline{\hspace{2cm}} \text{ kg} \times \underline{\hspace{2cm}} \text{ ms}^{-2} \\ &= \underline{\hspace{2cm}} \text{ N}\end{aligned}$$

2a. Calculate the mass of an octopus of weight 2000N on Earth ($g = 9.8 \text{ ms}^{-2}$).

$$\begin{aligned}\text{Mass} &= \underline{\hspace{2cm}} / \underline{\hspace{2cm}} \\ &= \underline{\hspace{2cm}} \text{ N} / \underline{\hspace{2cm}} \text{ ms}^{-2} \\ &= \underline{\hspace{2cm}} \text{ kg}\end{aligned}$$

b. Calculate the mass of a toy Fleeperwop of weight 825N on planet Zorple where g is 81 ms^{-2} .

$$\begin{aligned}\text{Mass} &= \underline{\hspace{2cm}} / \underline{\hspace{2cm}} \\ &= \underline{\hspace{2cm}} \text{ N} / \underline{\hspace{2cm}} \text{ ms}^{-2} \\ &= \underline{\hspace{2cm}} \text{ kg}\end{aligned}$$

c. Calculate the mass of a very big Snapperfart of 45,000N on planet Scarf where g is 12.34 ms^{-2} .

$$\begin{aligned}\text{Mass} &= \underline{\hspace{2cm}} / \underline{\hspace{2cm}} \\ &= \underline{\hspace{2cm}} \text{ N} / \underline{\hspace{2cm}} \text{ ms}^{-2} \\ &= \underline{\hspace{2cm}} \text{ kg}\end{aligned}$$

3a. Calculate the acceleration due to gravity on planet F239X8 if Blabberdoo has a mass of 45kg and weight 567N.

$$\begin{aligned}\text{Gravity} &= \underline{\hspace{2cm}} / \underline{\hspace{2cm}} \\ &= \underline{\hspace{2cm}} \text{ N} / \underline{\hspace{2cm}} \text{ kg} \\ &= \underline{\hspace{2cm}} \text{ ms}^{-2}\end{aligned}$$

b. Calculate the acceleration due to gravity on planet F239X8 if Gingerglass has a mass of 99kg and weight 789N.

$$\begin{aligned}\text{Gravity} &= \underline{\hspace{2cm}} / \underline{\hspace{2cm}} \\ &= \underline{\hspace{2cm}} \text{ N} / \underline{\hspace{2cm}} \text{ kg} \\ &= \underline{\hspace{2cm}} \text{ ms}^{-2}\end{aligned}$$

c. Calculate the acceleration due to gravity on planet F239X8 if Gingerglass has a mass of 10kg and weight 10N.

Gravity = _____ / _____

= _____ N / _____ kg

= _____ ms⁻²