check me out = if you think you're right = send me your answer

2. In each case, make the letter at the end the subject of the formula.

a) $y = mx + c$, (c)

$y = mx + c$

$y = mx + c - mx$

$-mx$

$y - mx = c$

b) $y = mx + c$, (m)

$y = mx + c - c$

$-c$

$\frac{y-c}{x} = \frac{mx}{x}$

$\frac{y-c}{x} = m$

c) $v^2 = u^2 + 2as$, (s)

$v^2 = u^2 + 2as - u^2$

$-u^2$

$\frac{v^2-u^2}{2a} = \frac{2as}{2a}$

$\frac{v^2-u^2}{2a} = s$

d) $2s = 2ut + at^2$, (a)

$2s = 2ut + at^2 - 2ut$

$-2ut$

$\frac{2s-2ut}{t^2} = \frac{at^2}{t^2}$

$\frac{2s-2ut}{t^2} = a$

e) $v^2 = u^2 + 2as$, (a)

$v^2 = u^2 + 2as - u^2$

$-u^2$

$\frac{v^2-u^2}{2s} = \frac{2as}{2s}$

$a = \frac{v^2-u^2}{2s}$

f) $y = a^2x + b^2$, (x)

$y = a^2x + b^2 - b^2$

$\frac{y-b^2}{a^2} = \frac{a^2x}{a^2}$

$\frac{y-b^2}{a^2} = x$

2. In each case, make the letter at the end the subject of the formula.

a) $A = 4\pi r^2, (r)$

$\frac{A}{4\pi} = \frac{4\pi r^2}{4\pi}$

$\sqrt{\frac{A}{4\pi}} = r$

b) $V = \frac{4}{3}\pi r^3, (r)$ $\cdot \frac{3}{4}$

$\frac{3}{4} \cdot \frac{3V}{4\pi} = \frac{\pi r^3}{\pi}$

$\sqrt[3]{\frac{3V}{4\pi}} = r$

c) $V = \pi r^2 h, (r)$

$\frac{V}{\pi h} = \frac{\pi r^2 h}{\pi h}$

$\sqrt{\frac{V}{\pi h}} = r$

d) $E = \frac{1}{2}mv^2 - \frac{1}{2}mu^2, (u)$ $-\frac{1}{2}mv^2$

$E - \frac{1}{2}mv^2 = \frac{1}{2}mu^2$

$2 \cdot \frac{1}{2}mu^2 = (-E + \frac{1}{2}mv^2) 2$

$\frac{mu^2}{m} = \frac{(-E + \frac{1}{2}mv^2)2}{m}$

$u = \sqrt{\frac{2(-E + \frac{1}{2}mv^2)}{m}}$

e) $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1, (y)$

$b^2 \cdot \left(\frac{x^2}{a^2} - 1\right) = \frac{y^2}{b^2} \cdot b^2$

$\sqrt{b^2\left(\frac{x^2}{a^2} - 1\right)} = y$

f) $ay^2 = x^3, (y)$

$\frac{ay^2}{a} = \frac{x^3}{a}$

$y = \sqrt{\frac{x^3}{a}}$

Mass and Weight Worksheet

F = ma **F = mg**

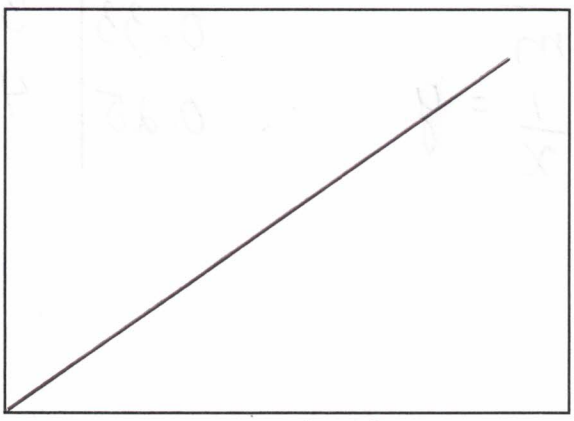
Force F is measured in N or in the States lbs (# Rere).

Mass is measured in kg.

Acceleration due to gravity is measured in m/s^2 or N/kg.

Sketch a graph of **Force vs Mass**

Force is directly proportional to mass.



let $a = 1 m/s^2$

$F = ma$

$F = m(1 m/s^2)$

direct variation

F	m
1	1
2	2
3	3

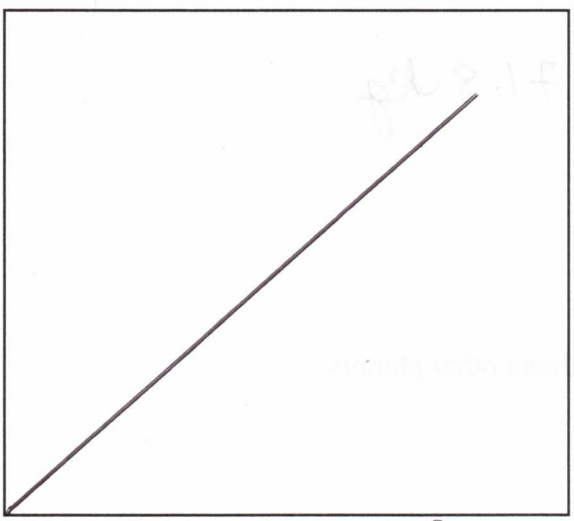
Sketch a graph of **Force vs Acceleration**

Force is directly proportional to acceleration.

let $m = 1 kg$

$F = ma$

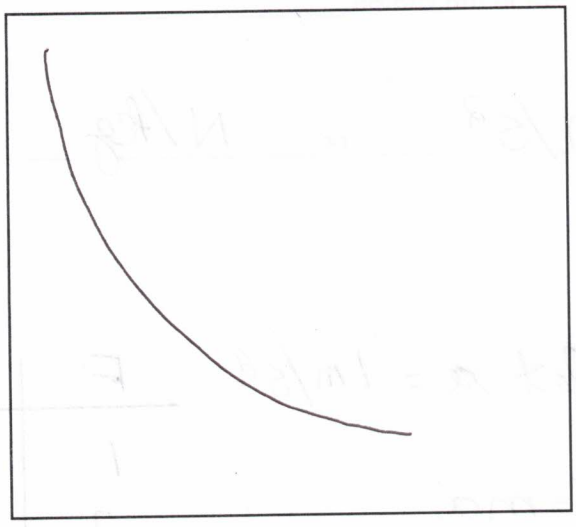
$F = (1 kg)a$



F	a
1	1
2	2
3	3

Sketch a graph of **Acceleration vs Mass**

Acceleration is inversely to mass.



$F = ma$ let $F = 1N$

$1 = ma$

$\frac{1}{m} = \frac{ma}{m}$

$\frac{1}{m} = a$

$\frac{1}{x} = y$

a	m
1	1
0.5	2
0.33	3
0.25	4

Questions:

1) How many atoms are in something determines its mass.

2) How strongly the planet you're on pulls on you is your weight.

3) Your weight will change depending on your location = which planet

4) Your mass never changes despite what planet you go to.

5) Knowing that 1 kg of mass = 2.2 lbs of weight, find:

A) Your mass in kilograms.

mass

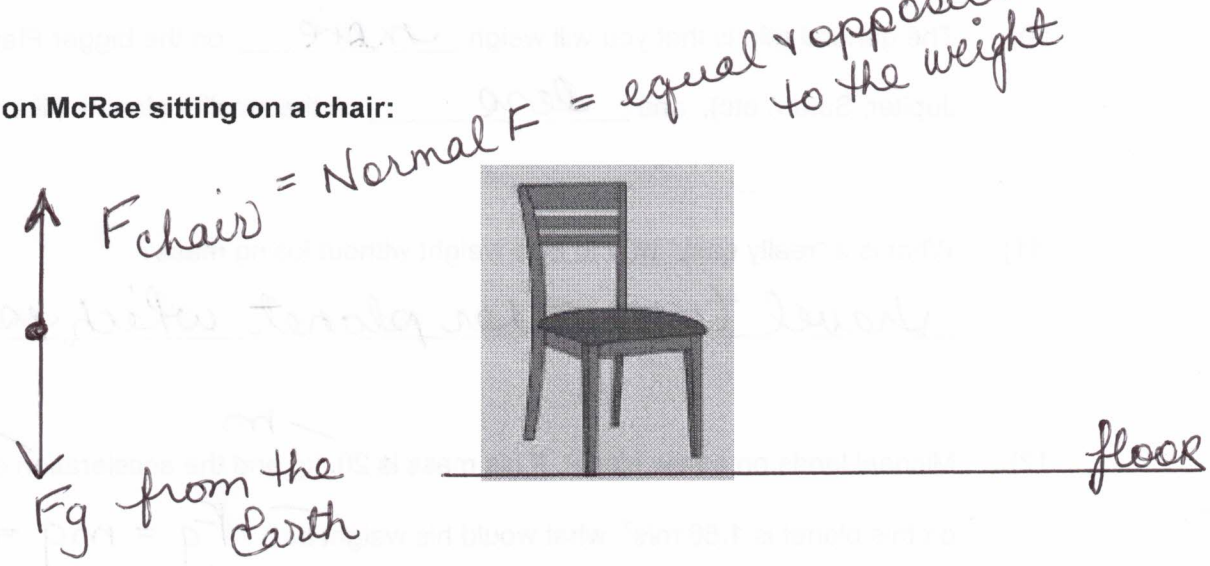
$158\,lbs \times \frac{1\,kg}{2.2\,lbs} = 71.8\,kg.$

B) Use this mass to solve for your weight on these other planets.

(9)

Planet / Moon	Your Mass Here (kg)	Gravitational Acceleration Here (m/s^2)	Your Weight Here (N)
Earth	71.8	9.8	703.64
Moon	71.8	1.6	114.88
Sun	71.8	274	19673.2
Jupiter	71.8	25.9	1859.62
Pluto	71.8	0.61	43.798

Forces acting on McRae sitting on a chair:



6) The mass of your new motorcycle is 250 kg.

What is:

A) Its weight on Earth in Newtons? force of gravity = Fg $F_g = mg = (250\,kg)(9.8\frac{m}{s^2}) = 2450N$

B) Its weight on the moon (in Newtons)? $F_g = mg = (250kg)(1.6\frac{m}{s^2}) = 400N$

C) The mass of your motorcycle on the moon? $250\,kg = m$

7) Somewhere in the Universe you place a 7.5 kg pumpkin on a spring scale. g?

If the scale reads 78.4 N, what is the acceleration due to gravity at that location?

$F_g = mg$, $\frac{F_g}{m} = \frac{mg}{m}$

$g = \frac{78.4\,N}{7.5\,kg} = 10.45\,m/s^2$

8) The weight of a pony standing still on Earth is 1025 N. $= F_g$ $\frac{F_g}{g} = \frac{mg}{g} = \frac{1025\,N}{9.8\,m/s^2} = 104.6\,k$

A) What is the pony's mass? $104.6\,kg = m$

B) What is the size of the normal force (the force pushing up from the surface) acting on the pony? └ equal & opposite to the wt (F_g)

C) Where will the pony weigh less (Moon, Jupiter, impossible)?

D) Where will the pony have less mass (Moon, Jupiter, impossible)?

9) In the physics sense, when a person goes on a diet, do they really want to lose weight or mass? Explain.

they want to lose atoms = ↓ mass.

10) The general rule is that you will weigh more on the bigger Planets (like Jupiter, Saturn etc), and less on the smaller planets (like the moon).

11) What is a "really easy" way to lose weight without losing mass?

travel to another planet which is smaller.

12) Michael lands on a new planet. If his mass is 20. kg and the acceleration due to gravity on this planet is 1.56 m/s^2, what would his weight be? m g $F_g = mg = (20\,kg)(1.56\,\frac{m}{s^2})$

$F_g = 31.2\,N$

13) Leslie is an astronaut on a new planet. She knows her mass is 70. kg, and she can calculate her weight on the planet to be 512 N. What is the acceleration due to gravity on the new planet?

$\frac{F_g}{m} = \frac{mg}{m} = \frac{512\,N}{70.\,kg} = 7.31\,\frac{m}{s^2}$

14) A ball that weighs 4.00 N on Earth weighs 19.00 Non a recently discovered planet. F_g F_g

What is the force of gravity on this new planet? $19.00\,N = F_g$