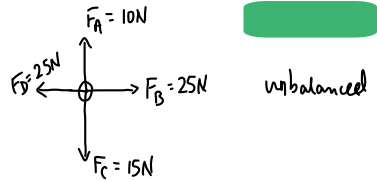
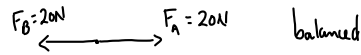
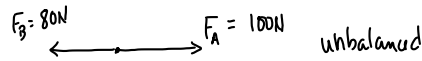


2-2 Forces + Dynamics

Dynamics - based on Newton's 3 laws

What is an unbalanced force?



Weight -

- the force of gravity on an object
- or
- the gravitational pull on an object.
- measured in newtons (N)
- depends on mass and location



Mass is not the same as weight!

- Angus 665N
- Anton 690N
- Tata 620N

Mass, in general, is the amount of matter in an object.

- inertial mass → relates to resistance to acceleration
- gravitational mass → the weight in a gravitational field



the two masses are equivalent:

g (the accel of free fall) = $9.81ms^{-2}$

g (the gravitational field strength) = $9.81Nkg^{-1}$

Weight: $\vec{W} = m\vec{g}$

where \vec{W} is the weight (force of gravity) (N)

m is the mass (kg)

\vec{g} is the gravitational field strength
($9.81 Nkg^{-1}$ near the Earth's surface)
(varies depending on location)

Angus weight = 665N [down]

On Jupiter:
 $\vec{W} = m\vec{g}$
 $m = \frac{W}{g}$
 $\vec{W} = (67.8 kg)(25.9 Nkg^{-1})$
 $W = 1.76 \times 10^3 N$ [down]
 $m = \frac{665N [down]}{9.81 Nkg^{-1} [down]}$
 $m = 67.8 kg \times 2.225 kg^{-1}$
 $m = 149 lbs$

