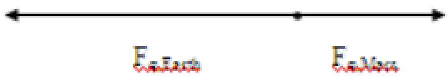
- The following is a FBD for an asteroid in the middle of outer space between planet Earth and planet Mars, but significantly closer to planet Earth. Since the force of gravity gets stronger the closer you are to an object, the force vector for Earth's gravity on the asteroid is larger than the force vector for Mars' gravity.



- Try drawing a FBD for an asteroid in between Planet X (on the left) and Planet Z (on the right), where the planets are the same size but the asteroid is <u>much</u> closer to Planet Z.

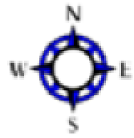
- If the force $F_{g,x}$ had a value of 100 N (for "Newtons") and the force $F_{g,z}$ had a value of 900 N what do you think is the overall/resultant/net amount of force that the asteroid feels?

$F_{net} = 800\,N$

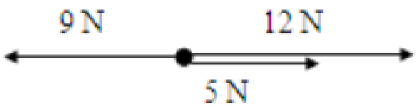
Def'n: The **net force, F_{net}**, is the vector addition ~~subtraction~~ of all forces acting on an object.

Def'n: The **net force**, $\mathbf{F_{net}}$, is the vector addition/subtraction of all forces acting on an object.

Exercise: Find the net force in each of the following situations.

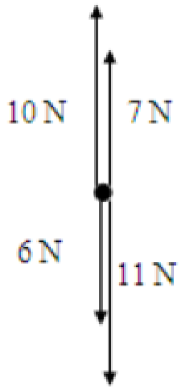


1)



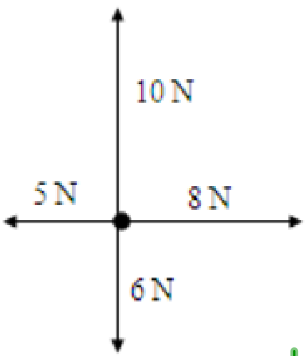
$\vec{F}_{net} = 8N\,[E]$

2)



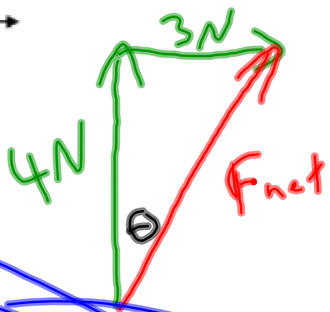
$\vec{F}_{net} = 0$

3)



$F_{net\,x} = 3N$

$F_{net\,y} = 4N$



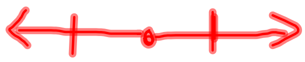
$F_{net} = \sqrt{3^2 + 4^2}$

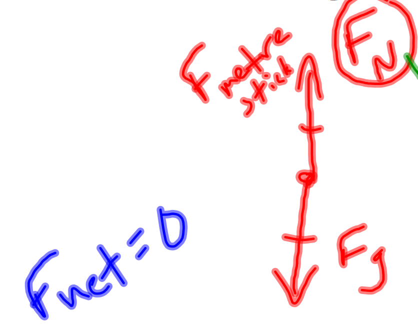
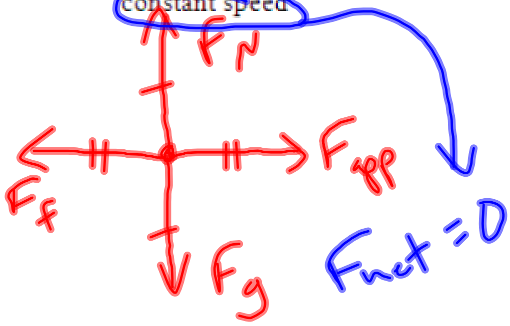
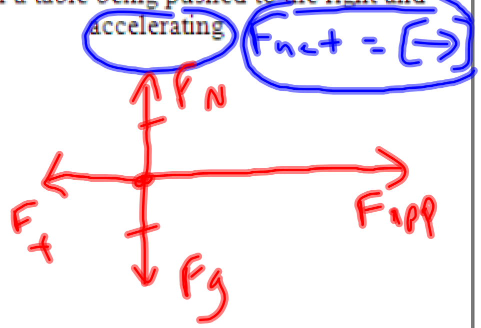
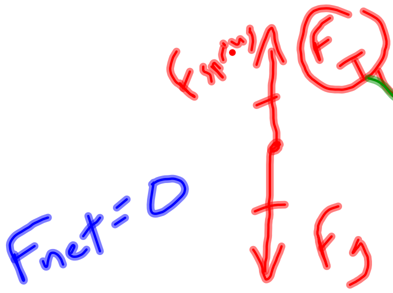
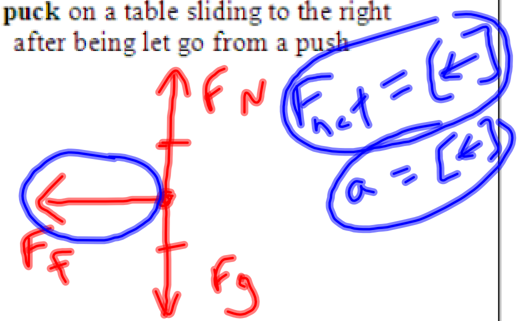
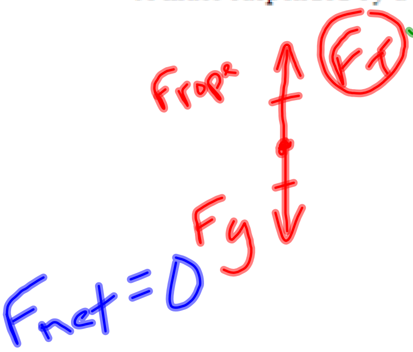
$= 5N$

$\theta = \tan^{-1}\left(\frac{3}{4}\right)$

$= 37°$

$\vec{F}_{net} = 5N\,[N37°E]$

A **mass** on a metre stick suspended across a valley	A **puck** on a table being pushed to the right at a constant speed F_g F_f $F_{app} \rightarrow F_{hand}$, F_{table}
A **mass** sitting on top of a table	A **puck** on a table being pushed to the right and accelerating * If vectors are the same size show like this:  If one is bigger show it:
A **mass** suspended by a spring	A **puck** on a table sliding to the right after being let go from a push 
A **mass** suspended by a rope	A **sled** being pulled by a girl at an angle of 35° above the horizon and a constant speed of 1.5 m/s

A **mass** on a metre stick suspended across a valley 	A **puck** on a table being pushed to the right at a constant speed 
A **mass** sitting on top of a table 	A **puck** on a table being pushed to the right and accelerating 
A **mass** suspended by a spring 	A **puck** on a table sliding to the right after being let go from a push 
A **mass** suspended by a rope 	A **sled** being pulled by a girl at an angle of 35° above the horizon and a constant speed of 1.5 m/s