Finding Net Force:

If forces going the same direction, ....

\[
\begin{align*}
40 \text{ N} \\
\rightarrow \\
60 \text{ N} \\
\end{align*}
\]

If forces are going opposite directions, ...

\[
\begin{align*}
50 \text{ N} \\
\rightarrow \\
90 \text{ N} \\
\end{align*}
\]
What force is required to accelerate a 25 kg object at 3.5 m/s/s?
A force of 280 N is applied to a 20 kg object. Find the acceleration of the object.
A force of 500 N is applied to a 45 kg object. What is the rate of acceleration of the object?
A car has a mass of 2400 kg. How much does the car weigh?
Determine the mass of a 3000 N boulder.
Find the unknown:

\[ m = 13 \text{ kg} \]

\[ a = ? \]
Find the unknown:

\[ 110 \text{ N} \quad \text{m} = 5 \text{ kg} \quad 80 \text{ N} \]

\[ a = ? \]
Find the unknown:

\[ m = ? \]

\[ a = 5 \text{ m/s/s Left} \]
Find the unknown:

\[ 100 \text{ N} \]

\[ F = ? \]

\[ m = 20 \text{ kg} \]

\[ a = 3 \text{ m/s/s right} \]
Find the unknown:

\[ F = ? \]

\[ m = 15 \text{ kg} \]

\[ a = 3 \text{ m/s/s left} \]
Find the unknown:

\[ F = ? \]

\[ m = 10 \text{ kg} \]

\[ a = 3 \text{ m/s/s left} \]
Find the unknown:

\[ F = ? \]

\[ m = 20 \text{ kg} \]

\[ a = 10 \text{ m/s/s left} \]
Find the unknown:

\[ m = 20 \text{ kg} \]

\[ a = ? \]
Find the unknown:

\[ m = 10 \text{ kg} \]

\[ a = ? \]
Find the unknown:

\[ \text{m} = 40 \text{ kg} \]

\[ a = ? \]
Match the following:

- velocity: Newtons (N)
- acceleration (including gravity): meters (m), seconds (s), m/s/s, kilograms (kg)
- distance
- mass
- Force (including weight): kilograms (kg)
- time: m/s
Match the following:

**Newton's 1st Law**
Law that relates force, mass and acceleration in the equation $F = ma$

**Newton's 2nd Law**
Law that states that any 2 objects have a force of attraction between them!!

**Newton's 3rd Law**
Law that states that an object at rest will remain at rest and an object in motion will remain in motion unless acted on by some **unbalanced** force!

**Newton's Law of Universal Gravitation**
Law that states for every action, there is an equal but opposite reaction!!
This man is twirling a rubber stopper at a constant speed in a horizontal path around his head. Is the velocity constant? Is the object accelerating? What happens when he lets go?