Quantitative Dynamics Name _____

Part A: Finding Net Force

Free Body Diagram

All forces on an object,
Each one represented by an arrow.

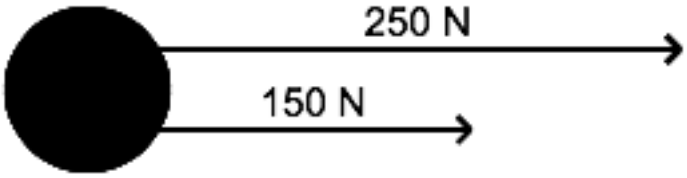
Finding Net Force (1-dimensional vector addition)

If the forces (arrows) are in the same direction, ADD.

If the force (arrows) are in different directions, SUBTRACT. The direction of the sum is the direction with more force.

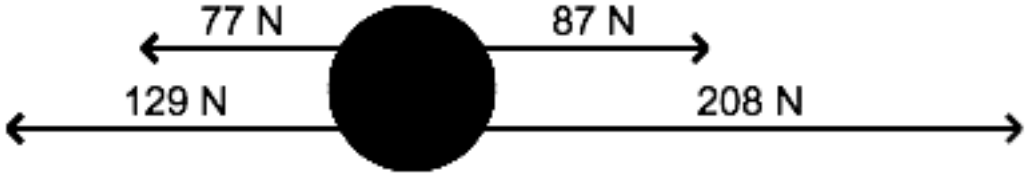
A.1. Find the net force for this *free-body diagram*. Include the *magnitude* and *direction* in your answer.

A2. Find the net force. (*Magnitude* and *direction*).



A.3 Find the net force (*Magnitude* and *direction*.)

A.4 Find the net force. (*Magnitude* and *direction*).



A.5. An object is being pushed, showing these two forces.
An object is pushed with a force of 50 N to the right.
Friction resists with a force of 20 N to the left.
a) Draw a free body diagram showing these two forces:

b) Find the net force. (*Magnitude* and *direction*)

A.6. A rocket ship is experiencing three forces.

- An upward thrust of 500 N.
- A weight of 200 N. The direction of weight is always *downward*.
- An air resistance force of 20 N downward.

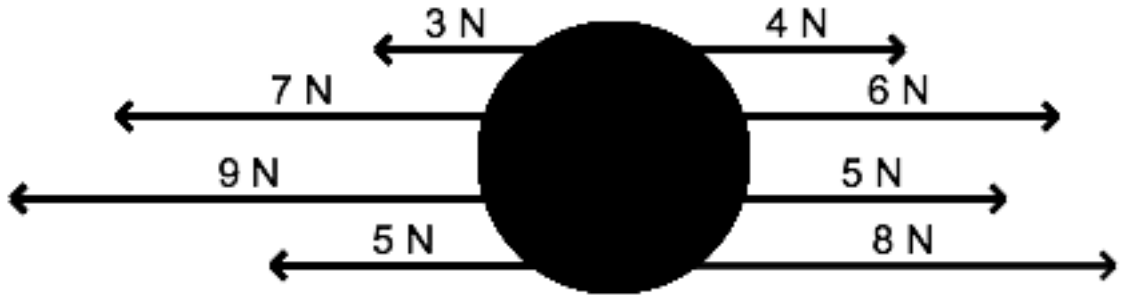
a) Draw a free body diagram showing these three forces.

b) Find the net force. (*Magnitude* and *direction*)

A.7. A book is lying on a table. There are two forces on the book.
It has a weight of 102 N. The direction of weight is always *downward*.
There is an upward normal force of 102 N.
a) Draw a free body diagram.

b) Find the net force. (*Magnitude* and *direction*)

A.8. Find the net force. (*Magnitude* and *direction*)



A.9
Two forces act on an object:
5 Newtons to the left.
A mystery force to the right.

The net force is 8 Newtons to the right.
What is the magnitude of the mystery force?

A.10

8 N to the left
4 N to the left
?? N to the right

The net force is 20 N to the right.
What is the magnitude of the mystery force?

Answers

A.1
50 N right.

A.2
400 N right

A.3
650 N left

A.4
89 N right

A.5
30 N right

A.6
280 N upward

A.7
Zero

A.8
1 N left

A.9
13 Newtons

A.10
8 Newtons