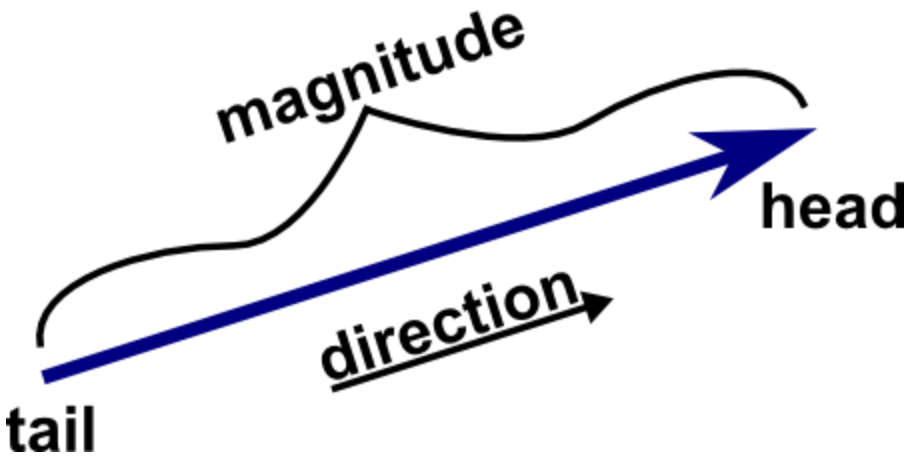
Scalars Vs Vectors

What is a Scalar?

What is a Vector?



You are probably very familiar with:

$$1 + 1 = 2$$

But can you think of a situation where:

$$1 + 1 = 0$$

How about:

$$1 + 1 = \sqrt{2}$$

Due to the direction component of a vector (ALL vectors have direction) we must be careful about how to add them.

Here's a riddle to bring home the point:
A hunter walks south 1 km. Then walks east 1km. Here he finds a bear and shoots it. He then walks 1 km north and ends up exactly where he started. What colour was the bear?

Let's define distance vs displacement for our next question:

Distance:

Displacement:

You like 1 km away from school. You walk to school and then, at the end of the day, you walk home.

What is the net distance?

What is the net displacement?

This is the key for adding vectors. Let's do an example with forces.

Assume that the scale is in Newtons.

Newtons vs Kilograms vs Pounds

Then, there is a 45 N force due to gravity of the fish pulling down on the scale. There is also a 45 N force from the scale pulling up.

The **Net Force, Resultant Force, Sum of Forces** equals 0. Not 90 N.

We draw our vectors. In a tip to tail fashion. The 'resultant' is the new vector between tip and tail.

Eg: Bottom of page 4.

You do page 5 #1-3.

Adding 3+ vectors.
Subtracting vectors.

Vector Decomposition.

Homework: pg10 All.