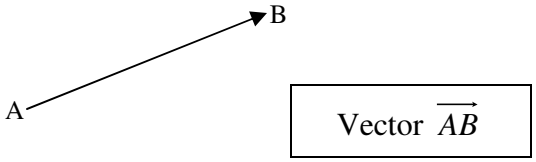
Vectors

A **scalar** is a quantity that involves magnitude.
(i.e. A car travels at 100km/h)
A **vector** is a quantity that involves both a magnitude and a direction.
(i.e. A car travels at 100km/h **east**)

Graphically, we represent vectors as a line segment with an arrow indicating its direction.



Symbolically, we write this using the endpoints ($\overrightarrow{AB}$) or with a single letter ($\vec{v}$).
B is the "tip" of the vector *A* is the "tail" of the vector.

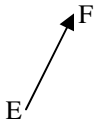
The magnitude of a vector is indicated by absolute value brackets. The magnitude of $\overrightarrow{AB}$ is written $\left|\overrightarrow{AB}\right|$.

Two vectors are **parallel** if they have the same (or opposite) directions.
Two vectors are **equivalent** if their magnitude and direction are the same.
Two vectors are **opposite** if the have the same magnitude and opposite direction.

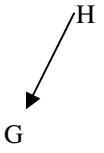
Example 1: Given vector $\overrightarrow{AB}$, create a vector that is

a. Parallel to $\overrightarrow{AB}$

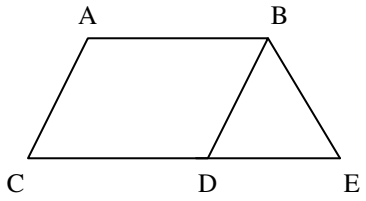
b. Equivalent to $\overrightarrow{AB}$



c. Opposite to $\overrightarrow{AB}$



Example 2: In the diagram, ABCD is a parallelogram and BD = BE. Name all the vectors that are…



a. Parallel to $\overrightarrow{CE}$
$\overrightarrow{CD}$, $\overrightarrow{EC}$, $\overrightarrow{DC}$, $\overrightarrow{ED}$, $\overrightarrow{DE}$, $\overrightarrow{AB}$, and $\overrightarrow{BA}$

b. Equivalent to $\overrightarrow{CE}$
There are no vectors that are equivalent to $\overrightarrow{CE}$.

c. Opposite to $\overrightarrow{AC}$.
$\overrightarrow{CA}$ and $\overrightarrow{DB}$

d. Have the same magnitude as $\overrightarrow{AC}$.
$\overrightarrow{CA}$, $\overrightarrow{DB}$, $\overrightarrow{BD}$, $\overrightarrow{BE}$, and $\overrightarrow{EB}$

Homework: pg. 45 #1, 3, 8, 12, 13, 11