4.1 Introduction to Vectors Worksheet with solutions

This document was composed and formatted by Annie Bernatchez.

The course material originated from www.jensenmath.ca

1) Convert each true bearing to its equivalent quadrant bearing.

a) 065°	b) 120°	c) 235°	d) 270°	e) 310°	f) 017°
$N65°E$	$S60°E$	$S55°W$	W	$N50°W$	$N17°E$

2) Convert each quadrant bearing to its equivalent true bearing.

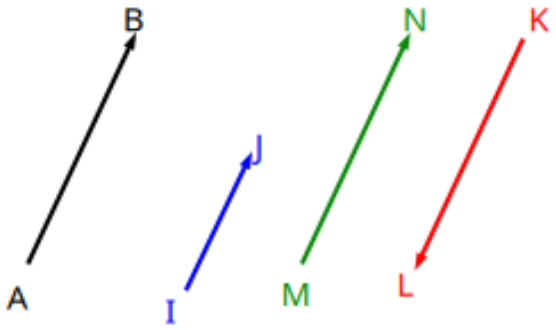
a) N40°E	b) S65°E	c) S32°W	d) N27°W	e) S54°W	f) N11°W
040°	115°	212°	333°	234°	349°

3) In the space to the right, draw and name…

a) a vector parallel to $\overrightarrow{AB}$

b) a vector opposite to $\overrightarrow{AB}$

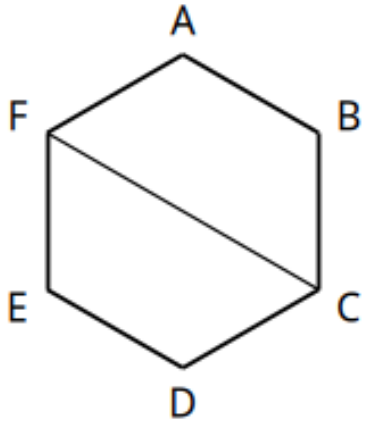
c) a vector equivalent to $\overrightarrow{AB}$



Diagrams may vary. For example, in the diagram shown, $\overrightarrow{IJ}$ is parallel to $\overrightarrow{AB}$, $\overrightarrow{KL}$ is opposite to $\overrightarrow{AB}$, and $\overrightarrow{MN}$ is equivalent to $\overrightarrow{AB}$.

4) Name all the equivalent vectors in each diagram.

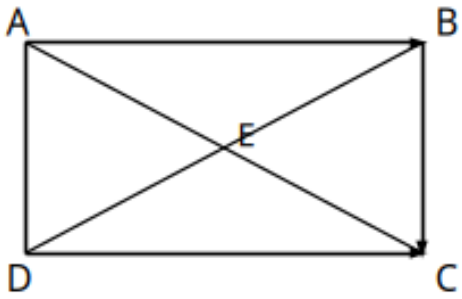
a)



$\overrightarrow{AB} = \overrightarrow{ED}$, $\overrightarrow{BC} = \overrightarrow{FE}$, $\overrightarrow{CD} = \overrightarrow{AF}$, $\overrightarrow{DE} = \overrightarrow{BA}$, $\overrightarrow{EF} = \overrightarrow{CB}$, $\overrightarrow{FA} = \overrightarrow{DC}$, $\overrightarrow{FB} = \overrightarrow{EC}$, $\overrightarrow{BF} = \overrightarrow{CE}$

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b)



$\overrightarrow{AB} = \overrightarrow{DC}$, $\overrightarrow{BA} = \overrightarrow{CD}$, $\overrightarrow{AD} = \overrightarrow{BC}$, $\overrightarrow{DA} = \overrightarrow{CB}$, $\overrightarrow{DE} = \overrightarrow{EB}$, $\overrightarrow{BE} = \overrightarrow{ED}$, $\overrightarrow{AE} = \overrightarrow{EC}$, $\overrightarrow{CE} = \overrightarrow{EA}$

5) State the opposite of each vector.

a) 300 km north

300 km south

b) 700 N on a bearing of 120°

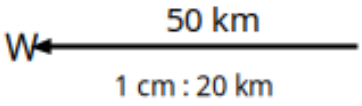
700 N on a bearing of 300°

c) 180 km/h on a quadrant bearing of S25°W

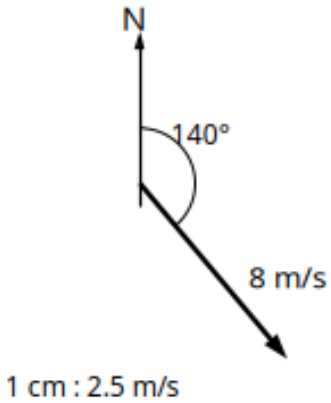
180 km/h on a quadrant bearing of N25°E

6) Use an appropriate scale to draw each vector. Label magnitude, direction

a) displacement of 50 km west

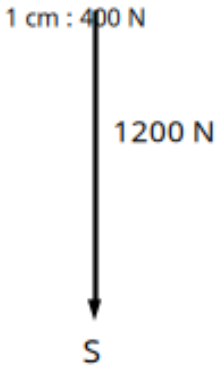


b) velocity of 8 m/s on a true bearing of 140°

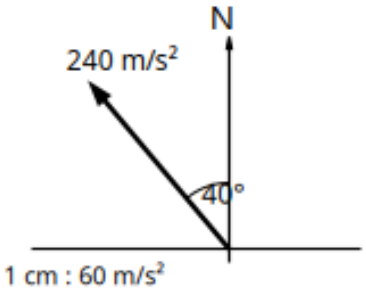


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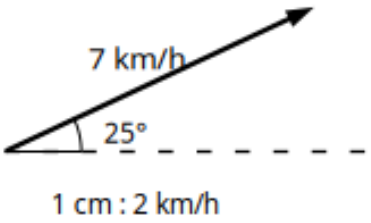
c) force of 1200 N downward



d) acceleration of 240 m/s² on a quadrant bearing of N40°W



e) velocity of 7 km/h at 25° to the horizontal



7) State whether the following are vectors or scalars:

a) A table weighs 80 N

Vector—weight is due to the force of gravity and therefore has a direction

b) A woman's age is 60 years old

Scalar—this has no direction

c) 300 km/h

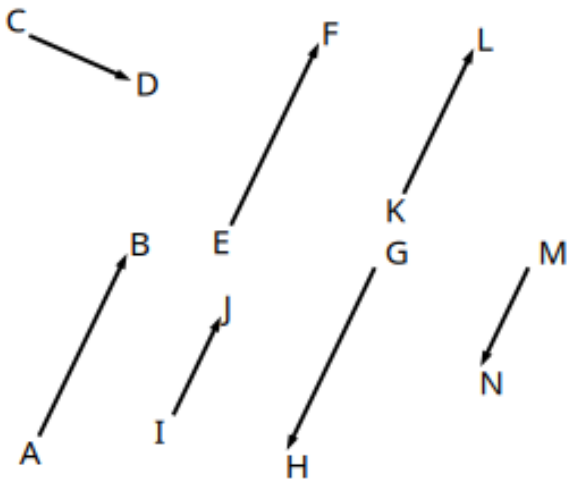
Scalar—there is no direction so this is just speed

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d) An elevator lifts a person 20 m

Vector—there is magnitude and direction (up)

8)



a) Which vectors are parallel to $\overrightarrow{AB}$?

$\overrightarrow{EF}$, $\overrightarrow{IJ}$, $\overrightarrow{KL}$, $\overrightarrow{GH}$

b) Which vectors are equivalent to $\overrightarrow{AB}$?

$\overrightarrow{EF}$

c) Which vectors are opposite to $\overrightarrow{AB}$?

$\overrightarrow{GH}$

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