# 4.1 Introduction to Vectors Worksheet

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° |
|---|---|---|---|---|---|
| | | | | | |

**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 |
|---|---|---|---|---|---|
| | | | | | |

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

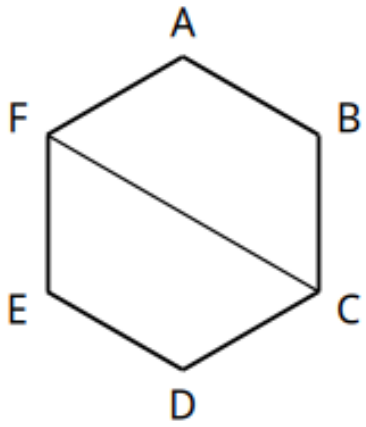
a) a vector parallel to $\overrightarrow{AB}$

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

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

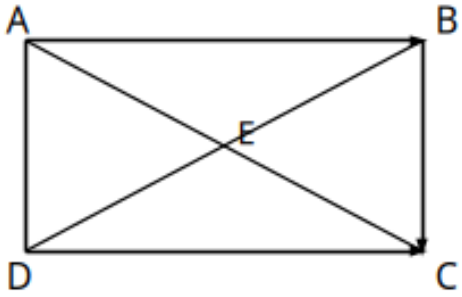
**4)** Name all the equivalent vectors in each diagram.

a)




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b)




**5)** State the opposite of each vector.

a) 300 km north

b) 700 N on a bearing of 120°

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

**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°

c) force of 1200 N downward

d) acceleration of 240 $m/s^2$ 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

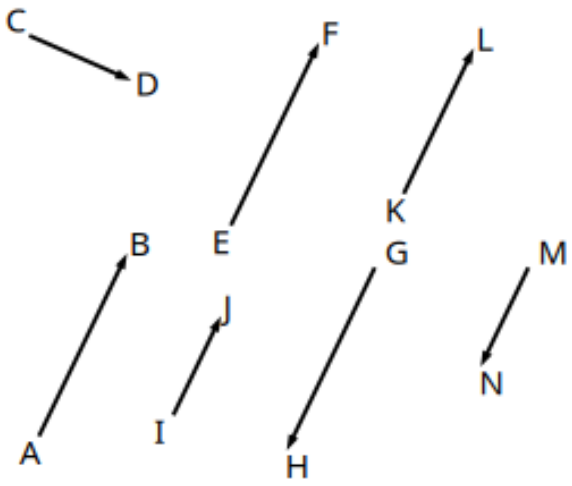
b) A woman's age is 60 years old

c) 300 km/h

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d) An elevator lifts a person 20 m

**8)**




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

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

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

## Answer Key

**1)** a) N65°E b) S60°E c) S55°W d) W e) N50°W f) N17°E

**2)** a) 40° b) 115° c) 212° d) 333° e) 234° f) 349°

**3)** Diagrams may vary. For example, $\overrightarrow{IJ}$ is parallel to $\overrightarrow{AB}$, $\overrightarrow{KL}$ is opposite to $\overrightarrow{AB}$, and $\overrightarrow{MN}$ is equivalent to $\overrightarrow{AB}$.

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

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)** a) 300 km south b) 700 N on a bearing of 300° c) 180 km/h on a quadrant bearing of N25°E

**6)** Diagrams may vary.

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

b) Scalar—this has no direction

c) Scalar—there is no direction so this is just speed

d) Vector—there is magnitude and direction (up)

**8)** a) $\overrightarrow{EF}$, $\overrightarrow{IJ}$, $\overrightarrow{KL}$, $\overrightarrow{GH}$ b) $\overrightarrow{EF}$ c) $\overrightarrow{GH}$

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