

# Monday Reading Assessment: Unit 0, and vectors

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September 11, 2019

## 1 Chapter 2.3 - Algebra of Vectors

- Which of the following is a correct expression for the multiplication of a scalar  $a$  and a vector  $\vec{p} = p_x\hat{i} + p_y\hat{j}$ ?
  - A:  $a\vec{p} = ap_x\hat{i} + p_y\hat{j}$
  - B:  $a\vec{p} = p_x\hat{i} + ap_y\hat{j}$
  - C:  $a\vec{p} = ap_x\hat{i} + ap_y\hat{j}$
  - D:  $a\vec{p} = ap_x + ap_y$
- Suppose a displacement vector  $\vec{x}$  has a magnitude  $|\vec{x}|$ . Which of the following best describes the quantity  $\vec{x}/|\vec{x}|$ ?
  - A:  $\vec{x}/|\vec{x}|$  is a scalar number with the magnitude of  $\vec{x}$ .
  - B:  $\vec{x}/|\vec{x}|$  is a vector with the magnitude of  $\vec{x}$ .
  - C:  $\vec{x}/|\vec{x}|$  is a vector with magnitude of zero.
  - D:  $\vec{x}/|\vec{x}|$  is a vector with magnitude of one.
- Figure 1 contains a 2D coordinate system containing four vectors representing the forces with which four puppies pull a toy. **Suppose the angles  $\alpha$ ,  $\beta$ , and  $\gamma$  are all 45 degrees instead of those given**, and suppose each puppy pulls with equal force. (a) If Dug pulls with equal force as well, what angle must Dug's force vector make with the x-axis if the net force is zero? (b) If Dug lets go and the only puppies pulling are A, B, and C, in which direction will the toy accelerate?

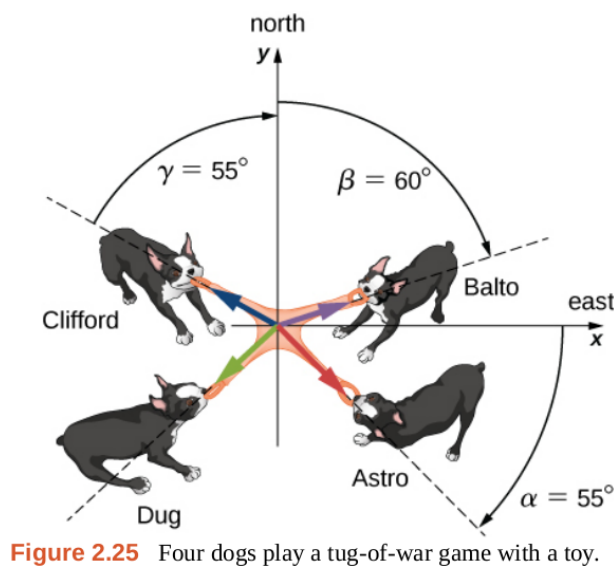


Figure 1: A diagram of the vectors of “force” from four puppies pulling in different directions.