

Name: \_\_\_\_\_

Quiz Score: \_\_\_\_/??

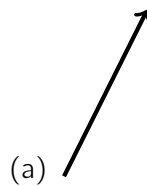
Answer each question completely in the area below. Show all work and explain your reasoning. If the work is at all ambiguous, it is considered incorrect. No phones, calculators, or notes are allowed. Anyone found violating these rules will be asked to leave immediately. Point values are in the square to the left of the question. If there are any other issues, please ask the instructor.

1. Consider the following two vectors:

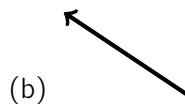


Match each of the following vector expressions with their corresponding graphical vector.

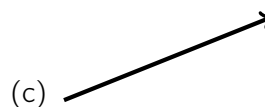
(a)  $u + v$ .



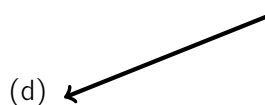
(b)  $u - v$ .



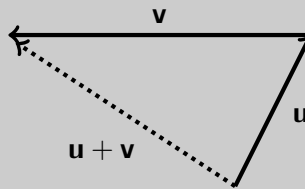
(c)  $v - u$ .



(d)  $2u$ .



**Solution:** I'll only show one solution, but the technique should give you the right idea. Consider  $\mathbf{u} + \mathbf{v}$ , for instance. The general technique is to take the tail of  $\mathbf{v}$  and attach it to the tip of  $\mathbf{u}$  and draw the resulting vector. Graphically, this yields:



Notice this is exactly the vector in (b). The other answers are (c), (d), (a).

2. In 3 dimensions, draw the following and state what shape it is:

$$x = 5.$$

*Hint:* this is not a line.

**Solution:** We discussed similar objects in class. For  $x = 5$ , the  $x$  component is fixed at 5 and  $y, z$  vary freely. This is exactly the description of a plane, which can be seen below. Any real attempt at conveying this was accepted.

