LESSON MAKER PRO

# Vector Move Lab

*Combine direction and distance with component vectors.*

**HIGH SCHOOL · MA.912.NSO.3.8**

**MA.912.NSO.3.8** "Add and subtract vectors algebraically or graphically."

NAME _____ DATE _____

## COMBINE COMPONENTS

To add vectors, add the x-components and add the y-components. To subtract vectors, subtract each component in the same order. Graphically, place the tail of the second vector at the head of the first vector, then draw the result from the first tail to the final head.

## WORKED EXAMPLE

Find <8, -5> + <-3, 7>.

1. Add the x-components: 8 + (-3) = 5.
2. Add the y-components: -5 + 7 = 2.
3. Write the result as <5, 2>.

**Answer: <5, 2>**

## PRACTICE 6 problems

**1** Find <1, -4> + <6, 2>.

**ANSWER** _____

**2** Find <9, 4> - <2, -6>.

**ANSWER** _____

**3** Let p = <-1, 6> and q = <4, -2>. Find p + q.

**ANSWER** _____

**4** Let r = <6, -9> and s = <-2, -4>. Find r - s.

**ANSWER** _____

**5** Find t if t + <2, -1> = <9, 6>.

**ANSWER** _____

**6** A path moves 4 units right and 1 unit down. Then it moves 2 units left and 6 units up. Write the total displacement as a vector.

**ANSWER** _____

## APPLY IT Show your work

**1** On a game map, a character first moves <4, -2> tiles and then moves <-1, 6> tiles. What is the character's net displacement?

WORK SPACE

**ANSWER** _____

**2** A robotics team wants its robot to have a total displacement of <9, 4> meters. The robot has already moved <2, -1> meters. What correction vector should it move next?

WORK SPACE

**ANSWER** _____

## CHALLENGE One step up

Let a = <4, -6>, b = <-2, 1>, and c = <9, 2>. Find a - (b + c).

WORK SPACE AND ANSWER

**ANSWER KEY**

# Vector Move Lab

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## PART 1 · PRACTICE

| # | PROBLEM | ANSWER |
|---|---|---|
| 1 | Find <1, -4> + <6, 2>. | **<7, -2>** |
| 2 | Find <9, 4> - <2, -6>. | **<7, 10>** |
| 3 | Let p = <-1, 6> and q = <4, -2>. Find p + q. | **<3, 4>** |
| 4 | Let r = <6, -9> and s = <-2, -4>. Find r - s. | **<8, -5>** |
| 5 | Find t if t + <2, -1> = <9, 6>. | **<7, 7>** |
| 6 | A path moves 4 units right and 1 unit down. Then it moves 2 units left and 6 units up. Write the total displacement as a vector. | **<2, 5>** |

## PART 2 · APPLY IT

1. **<3, 4>** Add the corresponding components: 4 + (-1) = 3 and -2 + 6 = 4.
2. **<7, 5>** Subtract the completed movement from the target displacement: <9, 4> - <2, -1> = <7, 5>.

## CHALLENGE

**<-3, -9>**

Accept equivalent vector notation that clearly gives the ordered pair of components. Check that students subtract both components when subtracting a vector, including changing the signs of negative components.