LESSON MAKER PRO

Vector Moves

Add, subtract, and scale vectors component by component.

HIGH SCHOOL · HSN-VM.B

CCSS.Math.Content.HSN-VM.B "Perform operations on vectors."

NAME _____ DATE _____

WORK WITH COMPONENTS

To add or subtract vectors, combine the matching components. To multiply a vector by a scalar, multiply each component by that scalar. Keep the components in the same order throughout your work.

WORKED EXAMPLE

Find 2u - v if u = <11, -8> and v = <-5, 13>.

1. Multiply u by 2: 2u = <22, -16>.
2. Substitute: 2u - v = <22, -16> - <-5, 13>.
3. Subtract matching components: <22 - (-5), -16 - 13> = <27, -29>.

Answer: <27, -29>

PRACTICE 6 problems

1 Find <4, -7> + <-1, 6>.

ANSWER _____

2 Find <9, 3> - <6, -4>.

ANSWER _____

3 Find -3<1, -4>.

ANSWER _____

4 Find 4<-3, 7>.

ANSWER _____

5 Find 3<4, -6> - <-7, 9>.

ANSWER _____

6 Let r = <6, 10>. Find -r.

ANSWER _____

APPLY IT Show your work

1 A student walks <7, -6> blocks, then walks <-4, 3> blocks. The first component shows east-west movement, and the second component shows north-south movement. What is the student's total displacement?

WORK SPACE

ANSWER _____

2 In a video game, an avatar moves <3, -7> tiles on each turn. What is the avatar's total displacement after 4 turns?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Solve for x: 4x + <3, -7> = <31, 17>.

_____

_____

ANSWER KEY

Vector Moves

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find <4, -7> + <-1, 6>.	**<3, -1>**
2	Find <9, 3> - <6, -4>.	**<3, 7>**
3	Find -3<1, -4>.	**<-3, 12>**
4	Find 4<-3, 7>.	**<-12, 28>**
5	Find 3<4, -6> - <-7, 9>.	**<19, -27>**
6	Let r = <6, 10>. Find -r.	**<-6, -10>**

PART 2 · APPLY IT

1. **<3, -3> blocks** Add the matching components: <7 + (-4), -6 + 3> = <3, -3>. The student ends 3 blocks east and 3 blocks south of the starting point.
2. **<12, -28> tiles** Multiply each component by 4: 4<3, -7> = <12, -28>. The avatar moves 12 tiles in the positive first direction and 28 tiles in the negative second direction.

CHALLENGE

x = <7, 6>

Accept vectors written with angle brackets or as ordered pairs when the component order is preserved. For the challenge, accept equivalent work that subtracts <3, -7> first and then divides both components by 4.