Addition and scalar multiplication: answers

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Answers to questions relating to the guide on addition and scalar multiplication.

*These are the answers to* [*Questions: Addition and scalar multiplication*](qs-additionandscalarmultiplication.qmd)*.* **Please attempt the questions before reading these answers!**

## Q1

Solve the following questions.

1.1. For the component, .For the component, .For the component, . So the answer is .

1.2. .

1.3. .

1.4. You can solve this by doing scalar addition component-wise. th component: , th component: , th component: . So the answer is .

## Q2

Solve the following questions.

2.1.

2.2.

2.3. or . This is different from the scalar .

2.4. This question is erroneous. You cannot add to a scalar .

## Q3

3.1. .

3.2. .

3.3.

3.4.

## Q4

4.1. By the laws of vector addition, , where and are the respective coordinates of and written in vector form. We can solve for by solving the above equation.

4.2., . . You can also calculate this by noticing . Then as required

4.3. Let be a real scalar. . , . This gives you the simultaneous equations . Solving this gives .

4.4. . . Solving this gives .

4.5. Let and be a real scalar. . This gives you the simultaneous equations . Solving this gives , . Which gives the answer .

4.6. . Solving this gives , and .

4.7. Let be a real scalar. . This gives the simultaneous equations . Solving this gives .

4.8. This gives the simultaneous equations . Solving this gives ,, and .