Answers: Vector addition and scalar multiplication

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Summary

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

*These are the answers to* [*Questions: Addition and scalar multiplication*](../questions/qs-addandsm.qmd)*.*

**Please attempt the questions before reading these answers!**

## Q1

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 addition componentwise. component: , component: , component: . So the answer is .

## Q2

2.1.

2.2.

2.3. or .

2.4. .

## 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. You can find by solving the above equation.

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

4.3. . . Solving this gives .

4.4. Let and be scalars. . This gives you the simultaneous equations Solving this gives , , which gives the answer .

4.5. . Solving this gives , and .

4.6. As they are parallel for some real scalar . This gives the simultaneous equations Eliminating and solving gives .

## Version history and licensing

v1.0: initial version created 08/23 by Renee Knapp, Kin Wang Pang as part of a University of St Andrews STEP project.

* v1.1: edited 05/24 by tdhc.

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