Vectors

GCSE Maths · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

a = (4, 1) and b = (–2, 3), written (top, bottom). Find a + b.

Step 1 · Add the tops

4 + (–2) = 2

Step 2 · Add the bottoms

1 + 3 = 4

Answer: a + b = (2, 4)

Check: Draw a, then b from its end: you finish 2 right, 4 up ✓

2. Now try one with the steps

With the same a and b, find 3a – 2b.

Step 1 · 3a

Step 2 · 2b

Step 3 · Subtract line by line

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Describe the movement of the column vector (5, –2) (top 5, bottom –2) in words. [1]

2. a = (2, 3), b = (4, –1). Find a + b, written (top, bottom). [1]

3. a = (2, 3), b = (4, –1). Find a – b. [1]

4. a = (2, 3). Find 4a. [1]

5. a = (2, 3). Find –a. [1]

6. c = (–3, 5). Find 2c + (1, –4). [2]

7. P is the point (2, 7) and Q is (5, 1). Find the column vector PQ. [2]

8. PQ = (3, –6). Write QP. [1]

9. a = (1, –2), b = (3, 4). Find 2a + 3b. [2]

10. a = (1, –2), b = (3, 4). Find 5a – 2b. [2]

11. A shape is translated by the vector (–4, 3). The point (6, 2) on it moves to which point? [2]

12. Find k if k(2, –3) = (–8, 12). [2]

13. (x, 4) + 2(3, y) = (10, –2). Find x. [2]

14. For the same equation (x, 4) + 2(3, y) = (10, –2), find y. [2]

15. Is (6, –9) parallel to (–2, 3)? Explain. [2]

4. Before you hand it in

Reading top 3, bottom 5 as 3 up, 5 right

Top = across (x), bottom = up (y), in the same order

(4, 1) – (–2, 3) = (2, –2)

4 – (–2) = 6. Subtracting a negative adds, so the answer is (6, –2).

AB = A – B

AB goes FROM A TO B, so it is B – A (end minus start).

Drawing a fraction line inside a column vector

A column vector has no fraction line. Write the two numbers one above the other in tall brackets.