Vectors Proof Questions

Grade 8/9 topic · Higher tier · Edexcel and AQA

How to use this pack
20 questions that get harder as you go. Questions 1–15 (70 marks) build up to the harder Grade 8–9 style questions at the end; aim to complete all 20. Show your working on the lines and write your final answer on the answer line, then mark yourself with the answers at the back. Diagrams are not drawn accurately. Total: 94 marks.

Warm-up

1 OAB is a triangle. OA = a and OB = b. M is the midpoint of OA and N is the midpoint of OB. Show that MN is parallel to AB. **[4 marks]**

Answer _____

2 OABC is a parallelogram with OA = a and OC = c. Show that the diagonals OB and AC bisect each other. **[5 marks]**

Answer _____

3 OAB is a triangle. OA = a and OB = b. P is on OA with OP : PA = 2 : 1 and Q is on OB with OQ : QB = 2 : 1. Show that PQ is parallel to AB. **[5 marks]**

Answer _____

4 OAB is a triangle. OA = a and OB = b. P is on AB with AP : PB = 2 : 3. Write OP in terms of a and b. **[5 marks]**

Answer _____

5 OAB is a triangle. OA = a and OB = b. M is the midpoint of AB. Show that OM = ½(a + b). **[4 marks]**

Answer _____

Core

6 OAB is a triangle. OA = a and OB = b. M is the midpoint of OA and N is the midpoint of OB. Show that MN is parallel to AB. **[4 marks]**

Answer _____

7 OABC is a parallelogram with OA = a and OC = c. Show that the diagonals OB and AC bisect each other. **[5 marks]**

Answer _____

8 OAB is a triangle. OA = a and OB = b. P is on OA with OP : PA = 3 : 1 and Q is on OB with OQ : QB = 3 : 1. Show that PQ is parallel to AB. **[5 marks]**

Answer _____

9 OAB is a triangle. OA = a and OB = b. P is on AB with AP : PB = 2 : 3. Write OP in terms of a and b. **[5 marks]**

Answer _____

10 OAB is a triangle. OA = a and OB = b. M is the midpoint of AB. Show that OM = ½(a + b). **[4 marks]**

Answer _____

Stretch

11 OAB is a triangle. OA = a and OB = b. M is the midpoint of OA and N is the midpoint of OB. Show that MN is parallel to AB. **[5 marks]**

Answer

12 OABC is a parallelogram with OA = a and OC = c. Show that the diagonals OB and AC bisect each other. **[5 marks]**

Answer

13 OAB is a triangle. OA = a and OB = b. P is on OA with OP : PA = 1 : 3 and Q is on OB with OQ : QB = 1 : 3. Show that PQ is parallel to AB. **[5 marks]**

Answer _____

14 OAB is a triangle. OA = a and OB = b. P is on AB with AP : PB = 1 : 2. Write OP in terms of a and b. **[5 marks]**

Answer _____

15 OAB is a triangle. OA = a and OB = b. M is the midpoint of AB. Show that OM = ½(a + b). **[4 marks]**

Answer _____

Challenge

16 OAB is a triangle. OA = a and OB = b. M is the midpoint of OA and N is the midpoint of OB. Show that MN is parallel to AB. **[5 marks]**

Answer _____

17 OABC is a parallelogram with OA = a and OC = c. Show that the diagonals OB and AC bisect each other. **[5 marks]**

Answer _____

18 OAB is a triangle. OA = a and OB = b. P is on OA with OP : PA = 1 : 2 and Q is on OB with OQ : QB = 1 : 2. Show that PQ is parallel to AB. **[5 marks]**

Answer _____

19 OAB is a triangle. OA = a and OB = b. P is on AB with AP : PB = 1 : 3. Write OP in terms of a and b. **[5 marks]**

Answer _____

20 OAB is a triangle. OA = a and OB = b. M is the midpoint of AB. Show that OM = ½(a + b). **[4 marks]**

Answer _____