InkMaths

QUESTION WORKBOOK

Vectors in three dimensions

Vectors · Year 12–13

7 questions · 24 marks

PRINT EDITION

inkphysics.co.uk/maths/ · youtube.com/@InkPhysics

SECTION A · Warm-up

A1 Find the magnitude of the vector 6i − 2j + 3k. [2]

A2 Given a = 6i − 2j + 3k, write down the unit vector in the direction of a, and find a vector of magnitude 21 that is parallel to a. [3]

SECTION B · Standard

B1 The points A(1, 2, −1) and B(3, −2, 5) have position vectors a and b respectively. Find AB, the exact distance AB, and the midpoint of AB. [4]

B2 The vector ai + 4j + 8k has magnitude 12. Find the possible values of a. [3]

B3 Show that the points P(1, 1, 2), Q(3, 5, 4) and R(6, 11, 7) are collinear. [3]

SECTION C · Stretch

C1 The points A(1, 1, 1), B(2, 3, 3) and C(3, -1, 2) form a triangle. Show that the triangle is right-angled and isosceles. [6]

C2 The triangle ABC has vertices A(1, 1, 1), B(2, 3, 3) and C(3, -1, 2). Given that the angle at A is a right angle, find the exact area of the triangle. [3]