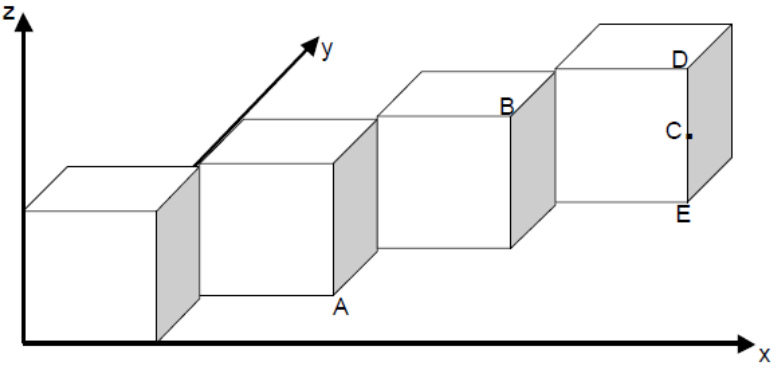
Q1. $u = 2\underline{i} - 2\underline{j} + 4\underline{k}$ and $v = \underline{i} + a\underline{j} + \sqrt{7}\underline{k}$. If $|u| = |v|$ find the value of a.

Q2. A triangle has vertices A(6, -1, 9), B(3, -2, 11) and C(7, -8, 14). Show that this triangle is right-angled at B.

Q3. The diagram shows 4 identical cubes placed edge to edge at right angles on a coordinate diagram. The cubes have length of side of 4 units. C is the midpoint of side DE.



(a) A has coordinates (8,4,0). Write down the coordinates of B and C.

(b) Calculate the size of angle ABC.

Q4. The diagram shows two vectors a and b with $|a| = 2$ and $|b| = 3\sqrt{3}$

(a) Evaluate (a) a.a (b) b.b (c) a.b

(b) Given $p = 2a + 3b$ evaluate p.p.