Multiple choice questions - Vectors in three dimensions

Year: Year 13 · 10

Question 1 $|\mathbf{i}+2\mathbf{j}+2\mathbf{k}| =$

- **A.** 3
- **B.** 5
- **C.** 9
- **D.** $\sqrt{5}$

Question 2  equals

- **A.** $\mathbf{a}-\mathbf{b}$
- **B.** $\mathbf{b}-\mathbf{a}$
- **C.** $\mathbf{a}+\mathbf{b}$
- **D.** $\frac{1}{2}(\mathbf{a}+\mathbf{b})$

Question 3 The midpoint of $A(2,0,4)$ and $B(4,6,0)$ is

- **A.** (6,6,4)
- **B.** (1,3,-2)
- **C.** (3,3,2)
- **D.** (3,3,4)

Question 4 A unit vector has magnitude

- **A.** 0
- **B.** the same as the vector
- **C.** $\sqrt{2}$
- **D.** 1

Question 5 $2\mathbf{i}-4\mathbf{j}+6\mathbf{k}$ is parallel to

- **A.** $\mathbf{i}-2\mathbf{j}+3\mathbf{k}$
- **B.** $\mathbf{i}+2\mathbf{j}+3\mathbf{k}$
- **C.** $2\mathbf{i}+4\mathbf{j}+6\mathbf{k}$
- **D.** $\mathbf{i}-2\mathbf{j}+6\mathbf{k}$

Question 6 Three points are collinear if

- **A.** AB = BC

- **B.** is parallel to
- **C.** the triangle is right-angled
- **D.** the vectors are perpendicular

Question 7 The magnitude of $3\mathbf{i} - 4\mathbf{j}$ is

- **A.** 7
- **B.** 1
- **C.** 5
- **D.** 25

Question 8 For a parallelogram $ABCD$, $\mathbf{d} =$

- **A.** $\mathbf{a} + \mathbf{b} - \mathbf{c}$
- **B.** $\mathbf{b} + \mathbf{c} - \mathbf{a}$
- **C.** $\mathbf{a} - \mathbf{b} + \mathbf{c} + \mathbf{d}$
- **D.** $\mathbf{a} + \mathbf{c} - \mathbf{b}$

Question 9 The space diagonal of a cuboid 2 by 3 by 6 is

- **A.** 7
- **B.** 11
- **C.** $\sqrt{11}$
- **D.** 5

Question 10 To show two particles collide you must

- **A.** show their velocities are equal
- **B.** show the position vectors are equal at the same time
- **C.** show their speeds are equal
- **D.** find their distance apart at t=0

Answer grid - Vectors in three dimensions

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Question	Answer	Explanation
1	**A**	sqrt(1+4+4).
2	**B**	End minus start.
3	**C**	Average.
4	**D**	Definition.
5	**A**	Half of it.
6	**B**	Parallel with a common point.
7	**C**	sqrt(9+16).
8	**D**	AD = BC.
9	**A**	sqrt(4+9+36).
10	**B**	Same place at same time.