

2. Vectors: A. Z. ALZHRANI

1.

Which one of the followings is not vector quantity?

speed

velocity

acceleration

force

2.

Any scalar quantity has

magnitude and direction

magnitude only

direction only

3.

If two vectors are perpendicular, then

their vector product is zero

their scalar product is zero

their resultant vector is zero

their subtracted vector is zero

4.

Suppose that $a = 2i - j + 5k$. What is the magnitude of the vector a ?

5.48

30

5.3

5.0

5.

Suppose that $a = i + 2j$, $b = i - j + k$, and $c = j + 3k$. What is the magnitude of the vector $2a - b + c$?

41

5.37

6.4

3.8

6.

Given that $A = 3i + 2j - k$, the unit vector in the opposite direction to A is

$0.27(3i + 2j - k)$

$0.27(3i - 2j - k)$

$-0.27(3i + 2j - k)$

$-0.27(3i + 2j + k)$

7.

Given that $u = 2i + 2j$ and $v = i - 3j + 2k$, the unit vector in the direction of $(u - 2v)$ is

$8i - 4k$

$8j - 4k$

$0.1(8i - 4k)$

$0.1(8j - 4k)$

8.

Relative to the origin, point P has position vector u and Q has position vector v . The vector QP is

$u - v$

$v - u$

$-u - v$

$u + v$

9.

Relative to the origin, point A has position vector $i - j + 3k$ and B has position vector $2i + j - 2k$, the magnitude of the vector AB is

$i + 2j - 5k$

$2i + k$

5.5

30

10.

Ali walks 5 km south-east then 3 km due west. Approximately how far from its starting position is Ali now ?

3.6

4.5

7

8

11.

Ali and Ahmad are both pushing on a box. Ali pushed the box first 12.0m east, while Ahmad pushed it after 5.0m north. What is the magnitude of the displacement?

19m

13m

7m

5m

12.

If $a = 2i + 3j$, $b = -3i + 2j$ and $c = 2i - j$, which of the following vectors is parallel to the resultant of a , b and c ,

$-2i - 6j$

$2i + 8j$

$2i - 8j$

$-2i + 8j$

13.

If $a = i + j$ and $b = i - j$, for which of the following values of k is the vector $(ka + b)$ parallel to $c = 3i - j$?

0.25

0.50

-0.25

-0.50

14.

If $u = -2i + 4j$, $v = 3i + 2j$, $w = 4i + 6j$ then $|u + v + w|$ is

15

13

$5i + 12j$

$12i + 5j$

15.

$a = i + j$ and $b = i - j$, for which of the following values of k is the vector $(ka + b)$ normal to $c = 3i - j$?

-1

1

-2

2

16.

If vectors A and B are parallel, then

their cross product is zero

their scalar product is zero

their resultant vector is zero

their subtracted vector is zero

17.

For two vectors, A and B, $|A + B| = 5$ units and $|A - B| = 3$ units, the magnitude of vector A if the magnitude of B is 2, is

4

5.1

5.5

3

18.

Ali walks 53.1 degrees north of east for 2.5km then due east for 2.0km. What is Ali's total displacement from his starting point?

3km

4km

5km

6km

19.

Consider vectors a and b such that $|a| = 11$, $|b| = 23$, and $|a - b| = 30$. Find

$|a + b|$

20

12

33

3

20.

The angle that the vector, $A = 2i - j + 3k$, makes with the positive y-axis is

67.5

88.5

105.5

74.5

21.

If $|a + b| = |a - b|$, then

$$|a|=0$$

$$|b|=0$$

$$|a \times b|=0$$

$$a \cdot b=0$$

22.

If $A = i - j + 3k$ and $B = 2i + j - 2k$, the angle between A and B is

$$59.8$$

$$70.4$$

$$99.6$$

$$120.2$$

23.

If $A = i - j + 3k$ and $B = 2i + j - 2k$, the vector C that is normal to both is

$$C = i - j + 3k$$

$$C = 2i + j - 2k$$

$$C = 3i + k$$

$$C = -i + 8j + 3k$$

24.

If $A = i - j + 3k$, $B = 2i + j - 2k$, and $C = ai + 2k$, the value of a that makes A, B, and C planner is

$$4$$

$$5$$

$$6$$

$$7$$

25.

A and B are two vectors in xy plane. If $A = 2i - 4j$ and the x-component of B is 2.5, what is the y-component of B that makes A and B perpendicular?

$$1.0$$

$$1.25$$

$$1.5$$

$$2.0$$