CHERCHER ACADEMY

1. A vector represents _____.
a) distance
b) speed
c) direction
d) all of the above

2. Which of the following is not a way to represent a vector?
a) a straight line with an arrow
b) a bolded letter
c) a scalar quantity
d) coordinates (x, y, z)

3. The magnitude of a vector represents _____.
a) its length

b) its direction
c) its speed
d) its displacement

4. Which of the following is an example of a vector quantity?
a) mass
b) temperature
c) velocity
d) time

5. Which of the following is an example of a scalar quantity?
a) displacement
b) force
c) distance
d) acceleration

6. Two vectors are added together to obtain a resultant vector. The process of adding vectors is called _____.

a) multiplication
b) addition
c) subtraction
d) division

7. The vector sum of a vector and its negative equals _____.
a) zero vector
b) the vector itself
c) a scalar quantity
d) infinity

8. Which operation can be performed on vectors to obtain a scalar quantity?
a) addition
b) subtraction
c) dot product
d) cross product

9. Which operation can be performed on vectors to obtain a vector quantity?

a) addition
b) subtraction
c) dot product
d) cross product

10. The dot product of two vectors results in _____.
a) a scalar quantity
b) a vector quantity
c) zero vector
d) undefined

11. The cross product of two parallel vectors is _____.
a) a scalar quantity
b) a vector quantity
c) zero vector
d) not defined

12. In a right-handed coordinate system, the positive z-axis points _____.

a) upwards
b) downwards
c) towards the left
d) towards the right

13. Which of the following is an example of a unit vector?
a) 3i
b) 2j
c) -4k
d) 6i + 3j + 2k

14. The components of a vector can be determined by _____.
a) multiplying the magnitude by the direction
b) multiplying the magnitude by the unit vector
c) adding the magnitude and direction
d) adding the magnitude and unit vector

15. Which of the following operations is possible with vectors?
a) multiplying two vectors together
b) dividing two vectors
c) finding the square root of a vector
d) none of the above

16. The direction of a vector can be represented by _____.
a) angles
b) slope
c) coordinates
d) all of the above

17. The x-component of a vector is represented by _____.
a) the magnitude of the vector
b) the length of the vector
c) the vertical component of the vector
d) the horizontal component of the vector

18. A vector is said to be in equilibrium when _____.
a) its magnitude is zero
b) its direction is zero
c) its components are zero
d) none of the above

19. The magnitude of a vector can be negative.
a) True
b) False

20. The resolution of a vector involves _____.
a) breaking it down into its components
b) multiplying it by a scalar
c) finding its direction
d) finding its magnitude

21. The addition of two vectors is commutative.

a) True
b) False

22. The magnitude of a vector can be greater than the sum of its components.
a) True
b) False

23. Which of the following is an example of a null vector?
a) a vector with zero magnitude and undefined direction
b) a vector with zero magnitude and any direction
c) a vector with any magnitude and zero direction
d) a vector with zero magnitude and zero direction

24. The resultant of two vectors with the same magnitude and direction is _____.

a) zero
b) the sum of the magnitudes
c) the difference of the magnitudes
d) not defined

25. In a right-angled triangle, the hypotenuse corresponds to _____.
a) the resultant vector
b) the x-component of the vector
c) the y-component of the vector
d) the magnitude of the vector

26. The magnitude of a vector can be zero.
a) True
b) False

27. Vectors can be added or subtracted by performing the same operation on their components.
a) True
b) False

28. The cross product of two vectors is commutative.
a) True
b) False

29. The dot product of two vectors is commutative.
a) True
b) False

30. The cross product of two perpendicular vectors results in _____.
a) a scalar quantity
b) a vector quantity
c) zero vector
d) undefined

31. The scalar projection of a vector is _____.
a) the magnitude of the vector

b) the projection of the vector on the x-axis
c) the projection of the vector on the y-axis
d) the magnitude of the vector multiplied by the cos of the angle between the vector and a specified axis

32. The vector projection of a vector is _____.
a) the magnitude of the vector
b) the projection of the vector on the x-axis
c) the projection of the vector on the y-axis
d) the magnitude of the vector multiplied by the cos of the angle between the vector and a specified axis

33. Which of the following is not a way to determine the direction of a vector?
a) using unit vectors
b) using angles
c) using components
d) using magnitude

34. The magnitude of the resultant of two vectors will be maximum when the angle between them is _____.
a) 0 degrees
b) 45 degrees
c) 90 degrees
d) 180 degrees

35. Which of the following is an example of a displacement vector?
a) a vector representing the distance traveled by a car
b) a vector representing the time it takes to run a race
c) a vector representing the force applied to an object
d) a vector representing the temperature of a room

36. The dot product of two vectors is equal

to zero when _____.
a) the vectors are parallel
b) the vectors are anti-parallel
c) the vectors are perpendicular
d) the vectors have the same magnitude

37. The dot product of two vectors is equal to the product of their magnitudes when _____.
a) the vectors are parallel
b) the vectors are anti-parallel
c) the vectors are perpendicular
d) the vectors have the same direction

38. The scalar projection of a vector is always positive.
a) True
b) False

39. The magnitude of the cross product of two vectors is always positive.

a) True
b) False

40. The angle between two vectors can be determined using _____.
a) the dot product
b) the cross product
c) the magnitude
d) both a and b

41. The cross product of two vectors can be represented as _____.
a) a scalar
b) a vector
c) a dot product
d) none of the above

42. The magnitude of the cross product of two vectors is equal to the product of their magnitudes when _____.
a) the vectors are parallel

b) the vectors are anti-parallel
c) the vectors are perpendicular
d) the vectors have the same magnitude

43. In a right-handed coordinate system, the cross product of two vectors has _____.
a) positive magnitude and positive z-component
b) negative magnitude and negative z-component
c) positive magnitude and negative z-component
d) negative magnitude and positive z-component

44. The cross product of two vectors is zero when _____.
a) the vectors are parallel
b) the vectors are anti-parallel
c) the vectors are perpendicular

d) the vectors have the same magnitude

45. The dot product of a vector with itself is equal to _____.
a) the product of its components
b) the product of its magnitudes
c) the square of its magnitude
d) the square of its components

46. The cross product of a vector with itself is always zero.
a) True
b) False

47. Which of the following is an example of a unit vector in 3D space?
a) $i + j + k$
b) $2i + 3j$
c) $i + 2j$
d) $-2k$

48. The cross product of two vectors is parallel to the plane containing the two vectors.
a) True
b) False

49. The dot product of two vectors is equal to the product of their magnitudes times the cos of the angle between them.
a) True
b) False

50. The cross product of two vectors is always perpendicular to both vectors.
a) True
b) False

By: BONA MOHAMMEDZAKIR JEMAL
January 2024 Chercher, Oromia.