Yakeen NEET 2.0 2026

Vectors

Assignment-02
By: M.R. Sir

1. Check which of the following is a unit vector:

(1) $\vec{A}=\frac{1}{\sqrt{3}}\hat{i}+\frac{1}{\sqrt{3}}\hat{j}$

(2) $\vec{B}=\sin\theta\hat{i}-\cos\theta\hat{j}$

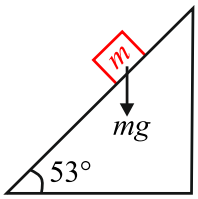
(3) $\vec{C}=\frac{\hat{i}}{\sqrt{3}}-\frac{\hat{j}}{\sqrt{3}}+\frac{\hat{k}}{\sqrt{3}}$

(4) $\vec{D}=0.8\hat{i}-0.6\hat{j}$

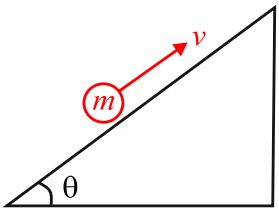
(5) $\vec{E}=\frac{3}{5}\hat{i}+\frac{4}{5}\hat{j}$

2. Draw given vector in graphical representation:
Force 10 N 30° North of East

3. Find component of gravitational force along inclined plane and perpendicular to inclined plane.



4. Component of velocity along x and y-axis.



5. Find unit vector of given vector:

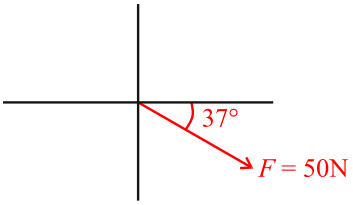
$\vec{A}=3\hat{i}+4\hat{j}$

$\vec{B}=-3\hat{i}+4\hat{j}-5\hat{k}$

$\vec{C}=2\hat{i}+3\hat{j}-\hat{k}$

$\vec{D}=\hat{i}+\hat{j}-2\hat{k}$

6. Following vector are given:
Then write it in vector form



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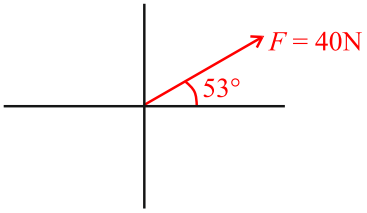
Then write it in vector form



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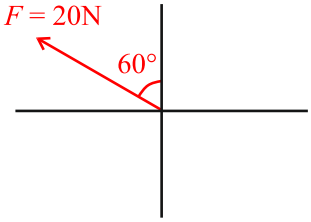

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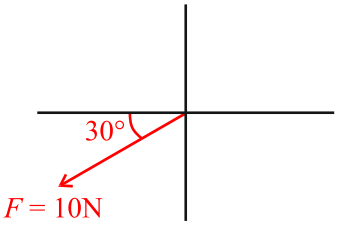
Then write it in vector form



10. Draw given vector in graphical representation:
Object is moving with velocity 60 m/s at 60° South of west

11. Draw given vector in graphical representation:
30 N force at 53° North of West

12. Draw given vector in graphical representation:
Force 40 N 53° South of East

13. A null vector is defined as a vector having:

(1) Zero Direction

(2) Zero magnitude and undefined direction

(3) Maximum magnitude and fixed direction

(4) Zero magnitude and fixed direction

14. Which of the following sets can never represent a system of collinear vectors?

(1) 2 N right, 3 N right, 5 N left

(2) 2 N up, 4 N up, 6 N down

(3) 2 N right, 3 N up, 4 N down

(4) 5 N left, 5 N right

15. If $\vec{A}+\vec{B}=0$, what is the value of $|\vec{A}|+|\vec{B}|$?

(1) 0 (2) $|A+B|$

(3) $2|A|$ (4) $|A|-|B|$

16. Which of the following sets of components gives a vector of zero magnitude?

(1) (0, 0) (2) (3, –3)

(3) (1, –1) (4) (2, 2)

17. A vector $\vec{A}$ has a magnitude of 5. You are told that the *x*-component of this vector is also 5.

What can you conclude about the *y*-component?

(1) It is zero

(2) It is positive

(3) It is imaginary

(4) It is negative

18. A vector $\vec{V}$ has a magnitude of 1 and makes equal angles with *x*, *y* and *z* axes. What is each component?

(1) $\frac{1}{\sqrt{3}}$ (2) $\frac{1}{3}$

(3) 1 (4) $\frac{1}{\sqrt{2}}$

19. A person walks 1 m east, then 1 m north. What is the unit vector in the direction of net displacement?

(1) $\frac{1}{\sqrt{2}}(\hat{i}+\hat{j})$ (2) $\frac{1}{2}(\hat{i}+\hat{j})$

(3) $(\hat{i}+\hat{j})$ (4) $\frac{1}{\sqrt{3}}(\hat{i}+\hat{j})$

20. Let $\vec{A}=a\hat{i}+b\hat{j}$ be a unit vector. If $a=\frac{3}{5}$, find *b*.

(1) $\frac{4}{5}$ (2) $\frac{2}{5}$

(3) $\sqrt{\left(\frac{1-9}{25}\right)}$ (4) 1

21. **Assertion (A):** The sum of two unit vectors can never be a unit vector.

Reason (R): The magnitude of the sum of two unit vectors is always greater than 1.

(1) Both A and R are true, and R is the correct explanation of A.

(2) Both A and R are true, but R is not the correct explanation of A.

(3) A is false, but R is true.

(4) Both A and R are false.

22. Three equal vectors are placed head to tail forming a triangle. What is the resultant vector?

(1) Equal to each vector

(2) 0

(3) Double of one vector

(4) Cannot be determined

23. Two vectors are added and the resultant is smaller than both. What must be the angle between them?

(1) $< 90°$ (2) $= 90°$

(3) $> 90°$ (4) $= 0°$

24. Vector addition is commutative.

(1) True (2) False

25. Vector addition violates the triangle inequality.

(1) True (2) False

26. **Assertion (A):** The direction of the vector $\vec{A} + \vec{B}$ lies between the directions of $\vec{A}$ and $\vec{B}$.

Reason (R): Vector addition follows the triangle law or parallelogram law of vectors.

(1) Both A and B are true, and R is the correct explanation of A.

(2) Both A and R are true, but R is not the correct explanation of A.

(3) A is false, but R is true

(4) Both A and B are false

27. Triangle law of vector addition holds when vectors are:

(1) Collinear

(2) Coplanar and in same direction

(3) Represented as two adjacent sides of a triangle taken in same order

(4) Draw from the same origin

28. A particle undergoes two displacements represented by vectors $\vec{A}$ and $\vec{B}$, making an angle θ between them. If resultant displacement is less than both A and B, what can be said about θ?

(1) $\theta = 0°$ (2) $\theta = 90°$

(3) $\theta > 90°$ (4) $\theta = 180°$

29. Two forces of magnitude 8 N and 15 N respectively act at a point. If the resultant forces is 17 N, the angle between the forces has to be

(1) 60° (2) 45°

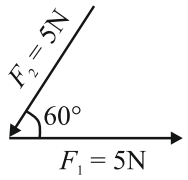
(3) 90° (4) 30°

30. Two $\vec{F}_1 = 5$ N due to east and $F_2 = 10$ N due north then resultant of these two force is

(1) $5\sqrt{5}$ N (2) 15 N

(3) 5 N (4) $\sqrt{5}$ N

31. Find net force = $\left(\vec{F}_1 + \vec{F}_2\right)$?



32. Two forces of 10 N and 6 N act upon a body. The direction of the forces are unknow. The resultant forces on the body may be

(1) 15 N (2) 3 N

(3) 17 N (4) 2 N

33. If $\vec{R} = \vec{A} + \vec{B}$ and $R = A + B$ then angle between $\vec{A}$ and $\vec{B}$ must be

(1) 90° (2) 60°

(3) 0° (4) 180°

34. If $\vec{R} = \vec{A} + \vec{B}$ and $R^2 \pm A^2 + B^2$ then angle between $\vec{A}$ and $\vec{B}$ may be

(1) 90° (2) 60°

(3) 120° (4) 80°

35. Two vector of magnitude 2 then resultant of these two vector may be?

(1) 2 (2) 8

(3) 5 (4) 6

36. Two force 5N and 2N acting on object then net force on object must not be:

(1) 2N (2) 1N

(3) 6N (4) Both (1) and (2)

37. Vector $\vec{A}$ is 2m long at 60° above the +x-axis and $\vec{B}$ is 2m long at 60° below the +x-axis then resultant will be:

38. If vector sum of two unit vector is a unit vector then:

39. The ratio of maximum and minimum magnitude of resultant of two vectors $\vec{a}$ and $\vec{b}$ is 3 : 1, then $|\vec{a}|$ in term of $|B|$.

40. Find angle between force $2P$ and $\sqrt{2}P$ act so that resultant force is $P\sqrt{10}$.

41. Two vector of magnitude 2 and 4 and resultant is $2\sqrt{3}$ find angle between vectors.

42. The sum of the magnitude of two force is 18 and magnitude of their resultant is 12. If resultant is at 90° with the force of smaller magnitude, then what is magnitude of force

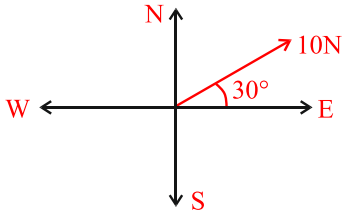
43. Which of the combination of three force can give zero resultant.

(1) (2, 4, 7) (2) (3, 1, 5)

(3) (2, 8, 11) (4) (3, 4, 2)

ANSWER KEY

1. (2, 3, 4, 5)

2. 

3. $\frac{4}{5}mg$

4. $v_x = v\cos\theta \qquad v_y = v\sin\theta$

5. $\vec{A} = \frac{3}{5}\hat{i} + \frac{4}{5}\hat{j}$

$\vec{B} = \frac{-3}{5\sqrt{2}}\hat{i} + \frac{4}{5\sqrt{2}}\hat{j} - \frac{1}{\sqrt{2}}\hat{k}$

$\vec{C} = \frac{2}{\sqrt{14}}\hat{i} + \frac{3}{\sqrt{14}}\hat{j} - \frac{1}{\sqrt{14}}\hat{k}$

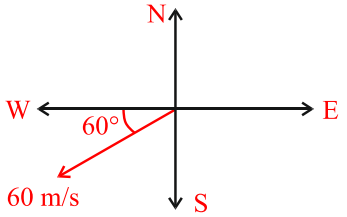
$\vec{D} = \frac{1}{\sqrt{6}}\hat{i} + \frac{1}{\sqrt{6}}\hat{j} - \frac{2}{\sqrt{6}}2\hat{k}$

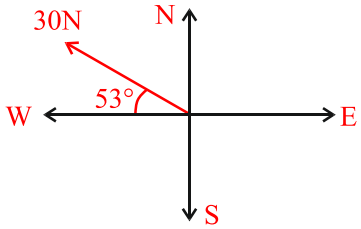
6. **Magnitude: 50N**
Direction: N 37° S or 37° South of North

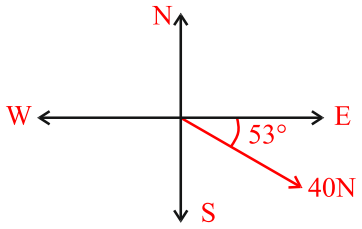
7. **Magnitude: 40N**
Direction: 53° North of East/37° East of North

8. **Magnitude: 20N**
Direction: 60° West of North/30° North of West

9. **Magnitude: 10N**
Direction: 30° South of West/60° West of South

10. 

11. 

12. 

13. (2)
14. (3)
15. (3)
16. (1)
17. (1)
18. (1)
19. (1)
20. (1)
21. (3)
22. (2)
23. (3)
24. (1)
25. (2)
26. (1)
27. (3)
28. (3)
29. ()
30. (A)
31. 5 N
32. (1)
33. (3)
34. (1)
35. (1)
36. (4)
37. 2m
38. Angle between them must be 120°
39. $|\vec{Q}| = 2|\vec{b}|$
40. 45°
41. 120°
42. 5 N, 13 N
43. (4)

PW Web/App - https://smart.link/7wwosivoicgd4

Library- https://smart.link/sdfez8ejd80if