



MATHS

BOOKS - BHARATI BHAWAN MATHS (HINGLISH)

Vectors and Addition of Vectors

Example

1. Prove that the vectors $3\vec{i} + 5\vec{j} + 2\vec{k}$, $2\vec{i} - 3\vec{j} - 5\vec{k}$ and $5\vec{i} + 2\vec{j} - 3\vec{k}$ form the sides of an equilateral triangle.

[Watch Video Solution](#)

2. Show that the points $(0, 7, 10)$, $(-1, 6, 6)$ and $(-4, 9, 6)$ form a right angled isosceles triangle.

[Watch Video Solution](#)

Exercise

1. If O is the circumcentre and P the orthocentre of ΔABC , prove that

$$\vec{OA} + \vec{OB} + \vec{OC} = \vec{OP}.$$

 [Watch Video Solution](#)

2. If O is the circumcentre and P the orthocentre of ΔABC , prove that

$$\vec{OA} + \vec{OB} + \vec{OC} = \vec{OP}.$$

 [Watch Video Solution](#)

3. If S is circumcentre, O is orthocentre of ΔABC , then $\vec{SA} + \vec{SB} + \vec{SC}$

=

 [Watch Video Solution](#)

4. If ABCDEF is a regular hexagon, prove that

$$\vec{AC} + \vec{AD} + \vec{EA} + \vec{FA} + 3\vec{AB}$$



Watch Video Solution

5. In Fig. ABCDEF is a regular hexagon. Prove that

$$\vec{AB} + \vec{AC} + \vec{AD} + \vec{AE} + \vec{AF} = 6\vec{AO}.$$



Watch Video Solution

6. Find area of the triangle formed by the points $(1, 2, 3)$, $(-1, -1, 8)$ and $(-4, 4, 6)$.



Watch Video Solution

7. The vectors of A,B,C and D are respectively

$$2\vec{i} + 3\vec{j} + 5\vec{k}, \vec{i} + 2\vec{j} + 3\vec{k}, -5\vec{i} + 4\vec{j} - 2\vec{k} \quad \text{and}$$

$$\vec{i} + 10\vec{j} + 10\vec{k}. \text{ Show tthat AB and CD are parallel.}$$



Watch Video Solution

8. Find all $\lambda \in R$ such that $(x, y, z) \neq (0, 0, 0)$ and
- $$\left(\vec{i} + \vec{j} + 3\vec{k}\right)x + \left(3\vec{i} - 3\vec{j} + \vec{k}\right)y + \left(-4\vec{i} + 5\vec{j}\right)z = \lambda\left(x\vec{i} - y\vec{j} + z\vec{k}\right)$$



Watch Video Solution

9. What is the unit vector \hat{a} parallel to the vector $\vec{a} = 3\vec{i} + 4\vec{j} - 2\vec{k}$?
Find the vector \vec{b} such that $\hat{a} + \vec{b}$ becomes the unit vector \vec{i} ?



Watch Video Solution

10. Vectors \vec{a}, \vec{b} are noncollinear. Find x so that the vectors $(x - 1)\vec{a} + \vec{b}$ and $(2 + 3x)\vec{a} - 2\vec{b}$ are collinear.



Watch Video Solution

11. The position vectors of the points A,B,C are $\vec{a}, \vec{b}, \vec{c}$ respectively. If $3\vec{a} + 2\vec{c} = 5\vec{b}$, are the points A,B,and C collinear? If so find $AB:BC$.

 [Watch Video Solution](#)

12. If three vector $2\vec{i} - \vec{j} - \vec{k}, \vec{i} + 2\vec{j} - 3\vec{k}, 3\vec{i} + \lambda\vec{j} + 5\vec{k}$ are coplanar then the value of λ is :

 [Watch Video Solution](#)

13. If $\vec{a}, \vec{b}, \vec{c}$ are three non collinear vectors then show that the following points are collinear.

$6\vec{a} - 4\vec{b} + 10\vec{c}, -5\vec{a} + 3\vec{b} - 10\vec{c}, 4\vec{a} - 6\vec{b} - 10\vec{c}$ and $2\vec{b} + 10\vec{c}$

 [Watch Video Solution](#)

14. If the points $A(2,3,-4)$, $B(1,-2,3)$ and $C(3, \lambda, -1)$ are collinear, then value of λ is

 [Watch Video Solution](#)

15. Show that the four point $(0, -1, -1)$, $(4, 5, 1)$, $(3, 9, 4)$ and $(-4, 4, 4)$ are coplanar and find the equation of the common plane.

 [Watch Video Solution](#)

16. Three non-zero vectors \vec{a} , \vec{b} , \vec{c} are such that no two of them are collinear. If the vector $(\vec{a} + \vec{b})$ is collinear with the vector \vec{c} and the vector $(\vec{b} + \vec{c})$ is collinear with vector \vec{a} , then prove that $(\vec{a} + \vec{b} + \vec{c})$ is a null vector.

 [Watch Video Solution](#)

