


Ques No.	Question
1 - 10390	<p>CLASS 12 BOARDS: MOST IMPORTANT QUESTIONS - Chapter 10. VECTOR ALGEBRA</p> <p>Find the projection of $\vec{b} + \vec{c}$ on \vec{a} where</p> $\vec{a} = 7\hat{i} - \hat{j} + 8\hat{k}, \quad \vec{b} = \hat{i} + 2\hat{j} + 3\hat{k} \text{ and } \vec{c} = \hat{j} + 4\hat{k}$ <p>Click to watch Free Video Solution of this question on Doubtnut</p>
2 - 10403	<p>CLASS 12 BOARDS: MOST IMPORTANT QUESTIONS - Chapter 10. VECTOR ALGEBRA</p> <p>Find the resultant of two velocities 6 km/hr and $6\sqrt{2}$ km/hr inclined to one another at an angle of 135.</p> <p>Click to watch Free Video Solution of this question on Doubtnut</p>
3 - 10404	<p>CLASS 12 BOARDS: MOST IMPORTANT QUESTIONS - Chapter 10. VECTOR ALGEBRA</p> <p>Two forces act at a point and are such that if the direction of one is reversed, the resultant is turned through a right angle. Show that the two forces must be equal in magnitude.</p> <p>Click to watch Free Video Solution of this question on Doubtnut</p>
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CLASS 12 BOARDS: MOST IMPORTANT QUESTIONS - Chapter 10. VECTOR ALGEBRA

Find the projection of $\vec{b} + \vec{c}$ on \vec{a} where

4 - 10510

$$\vec{a} = 2\hat{i} - 2\hat{j} + \hat{k}, \vec{b} = \hat{i} + 2\hat{j} - 2\hat{k} \text{ and}$$

$$\vec{c} = 2\hat{i} - \hat{j} + 4\hat{k}$$

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Find the value of λ which makes the vectors \vec{a} , \vec{b} and \vec{c}

5 - 10524

coplanar, where $\vec{a} = 2\hat{i} - \hat{j} + \hat{k}$, $\vec{b} = \hat{i} + 2\hat{j} - 3\hat{k}$

$$\text{and } \vec{c} = 3\hat{i} - \lambda\hat{j} + 5\hat{k}$$

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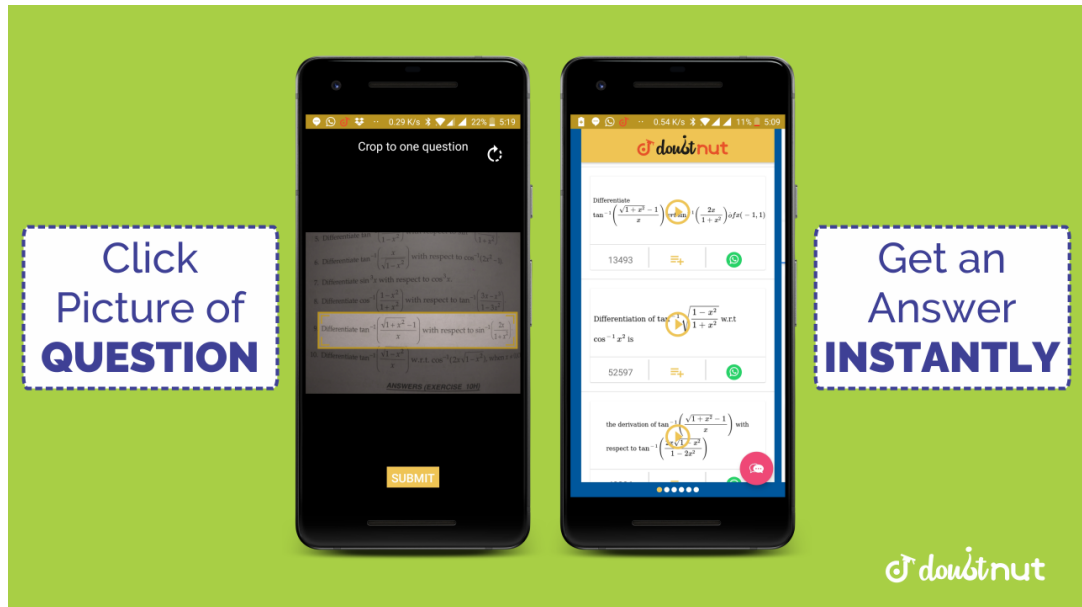
Find the resultant of two velocities 4 m/sec and 6 m/sec inclined to one another at an angle of 120° .

6 - 10526

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Show that the points (1,0), (6,0), (0,0) are collinear.

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For what value λ are the vectors

$\vec{a} = 2\hat{i} + \lambda\hat{j} + \hat{k}$ and $\vec{b} = \hat{i} - 2\hat{j} + 3\hat{k}$ perpendicular to

each other?

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If $\vec{a} + \vec{b} + \vec{c} = 0$ and $|\vec{a}| = 3$, $|\vec{b}| = 5$ and $|\vec{c}| = 7$,

show that the angle between \vec{a} and \vec{b} is 60° .

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If $\vec{a} = \hat{i} + \hat{j} + \hat{k}$ and $\vec{b} = \hat{j} - \hat{k}$, find a vector \vec{c} such that $\vec{a} \times \vec{c} = \vec{b}$ and $\vec{a} \cdot \vec{c} = 3$

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11 - 10578

Find a unit vector in the direction of $\vec{a} = 3\hat{i} - 2\hat{j} + 6\hat{k}$

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12 - 10579

Find the angle between the vectors

$$\vec{a} = \hat{i} - \hat{j} + \hat{k} \text{ and } \vec{b} = \hat{i} + \hat{j} - \hat{k}$$

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13 - 10605

Write a vector of magnitude 9 units in the direction of vector

$$-2\hat{i} + \hat{j} + 2\hat{k}$$

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14 - 10628

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If vectors $\vec{a} = 2\hat{i} + 2\hat{j} + 3\hat{k}$, $\vec{b} = -\hat{i} + 2\hat{j} + \hat{k}$ and $\vec{c} = 3\hat{i} + \hat{j}$ are such that $\vec{a} + \lambda \vec{b}$ is perpendicular to \vec{c} , then find the value of λ

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Find the shortest distance between the lines:

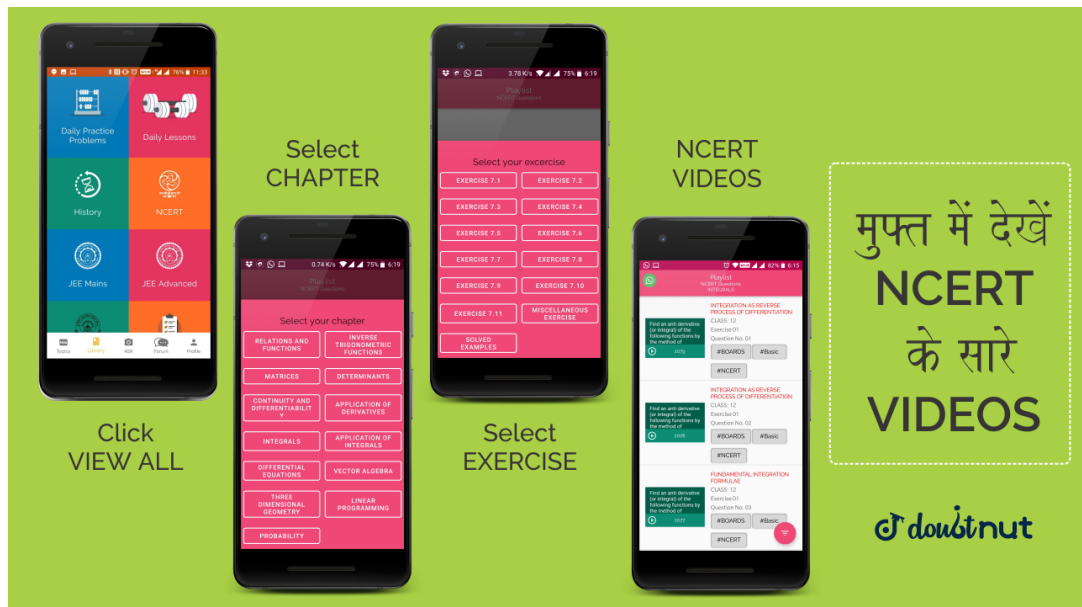
15 - 10629

$$\vec{r} = 6\hat{i} + 2\hat{j} + 2\hat{k} + \lambda (\hat{i} - 2\hat{j} + 2\hat{k}) \text{ and}$$

$$\vec{r} = -4\hat{i} - \hat{k} + \mu (3\hat{i} - 2\hat{j} - 2\hat{k})$$

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Let $\vec{a} = \hat{i} - \hat{j}$, $\vec{b} = 3\hat{j} - \hat{k}$ and $\vec{c} = 7\hat{i} - \hat{k}$. Find a vector \vec{d} which is perpendicular to both \vec{a} and \vec{b} , and \vec{c} .

16 - 10634

$$\vec{d} = 1$$

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If $\vec{a} = x\hat{i} + 2\hat{j} - z\hat{k}$ and $\vec{b} = 3\hat{i} - y\hat{j} + \hat{k}$ are two equal vectors, then write the value of $x + y + z$.

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If a unit vector \vec{a} makes angles $\frac{\pi}{3}$ with \hat{i} , $\frac{\pi}{4}$ with \hat{j} and an acute angle θ with \hat{k} , then find the value of θ .

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Find $|\vec{x}|$, if for a unit vector \vec{a} , $(\vec{x} - \vec{a}) \cdot (\vec{x} + \vec{a}) = 15$.

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P and Q are two points with position vectors $3\vec{a} - 2\vec{b}$ and $\vec{a} + \vec{b}$ respectively. Write the position vector of a point R which divides the line segment PQ in the ratio $2:1$ externally.

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21 - 10691

If $\vec{a} \times \vec{b} = \vec{c} \times \vec{d}$ and $\vec{a} \times \vec{c} = \vec{b} \times \vec{d}$ show that $\vec{a} - \vec{d}$ is parallel to $\vec{b} - \vec{c}$, where $\vec{a} \neq \vec{d}$ and $\vec{b} \neq \vec{c}$

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22 - 10696

Write the vector equation of the following line:

$$\frac{x - 5}{3} = \frac{y + 4}{7} = \frac{6 - z}{2}$$

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23 - 10713

If \vec{a} , \vec{b} , \vec{c} are three vectors such that $|\vec{a}| = 5$, $|\vec{b}| = 12$ and $|\vec{c}| = 13$, and $\vec{a} + \vec{b} + \vec{c} = \vec{O}$, find the value of $\vec{a} \cdot \vec{b} + \vec{b} \cdot \vec{c} + \vec{c} \cdot \vec{a}$.

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24 - 10728

Find the value of p , if $(2\hat{i} + 6\hat{j} + 27\hat{k}) \times (\hat{i} + 3\hat{j} + p\hat{k}) = \vec{0}$

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25 - 10750

Find λ if $(2\hat{i} + 6\hat{j} + 14\hat{k}) \times (\hat{i} - \lambda\hat{j} + 7\hat{k}) = \vec{0}$

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26 - 10761

If $\vec{\alpha} = 3\hat{i} + 4\hat{j} + 5\hat{k}$ and $\vec{\beta} = 2\hat{i} + \hat{j} - 4\hat{k}$, then express $\vec{\beta}$ in the form $\vec{\beta}_1 + \vec{\beta}_2$, where $\vec{\beta}_1$ is parallel to $\vec{\alpha}$ and $\vec{\beta}_2$ is perpendicular to $\vec{\alpha}$.

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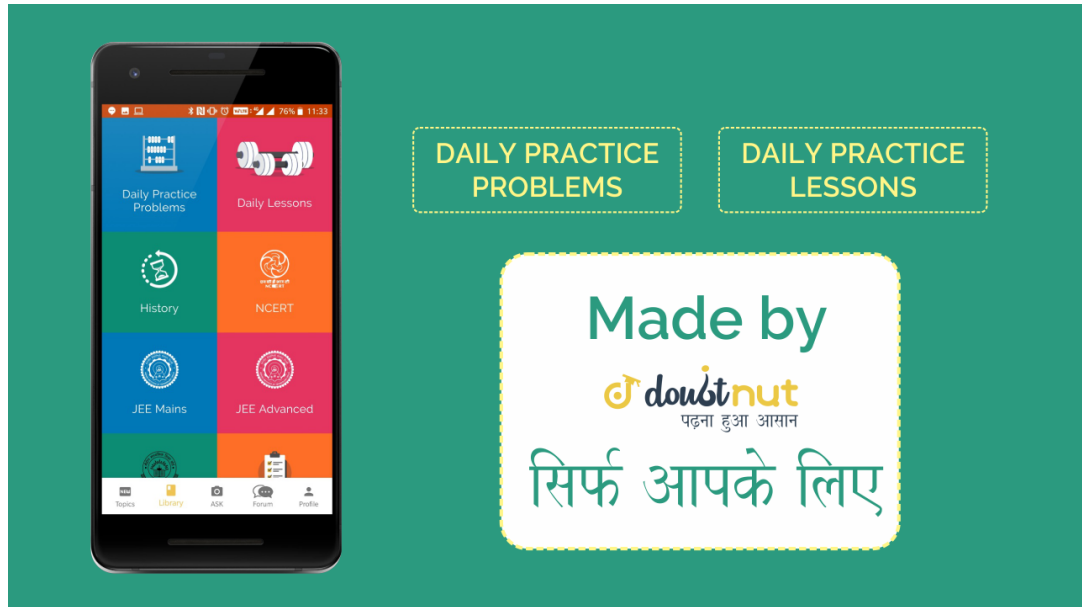
27 - 10787

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Using vectors, find the area of the triangle with vertices A (1, 1, 2), B (2, 3, 5) and C (1, 5, 5).

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28 - 10818

For what value of a the vectors $2\hat{i} - 3\hat{j} + 4\hat{k}$ and $a\hat{i} + 6\hat{j} - 8\hat{k}$ are collinear?

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29 - 10825

Let $\vec{a} = \hat{i} + 4\hat{j} + 2\hat{k}$, $\vec{b} = 3\hat{i} - 2\hat{j} + 7\hat{k}$ and $\vec{c} = 2\hat{i} - \hat{j} + 4\hat{k}$ Find a vector \vec{p} which is perpendicular to both \vec{a} and \vec{b} and $\vec{p} \cdot \vec{c} = 18$.

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Find the coordinates of the point where the line through the points A (3, 4, 1) and B (5, 1, 6) crosses the XY-plane.

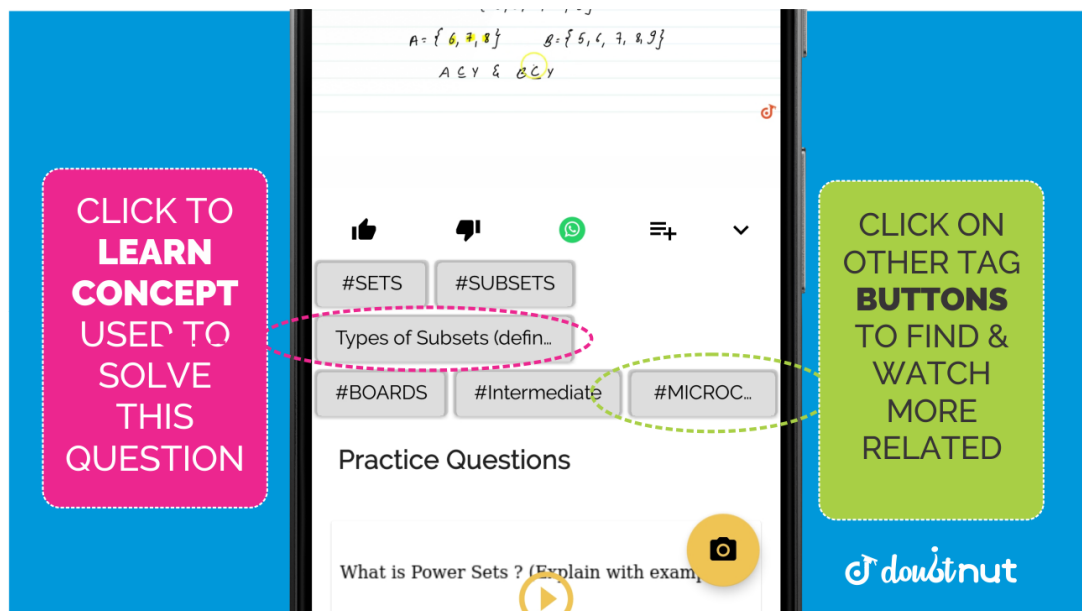
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31 - 10842

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32 - 10843

Find the projection of \vec{a} on \vec{b} , if $\vec{a} \cdot \vec{b} = 8$ and $\vec{b} = 2\hat{i} + 6\hat{j} + 3\hat{k}$.

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33 - 10850

Write the cartesian equation of the following line given in vector form : $\vec{r} = 2\hat{i} + \hat{j} - 4\hat{k} + \lambda (\hat{i} - \hat{j} - \hat{k})$

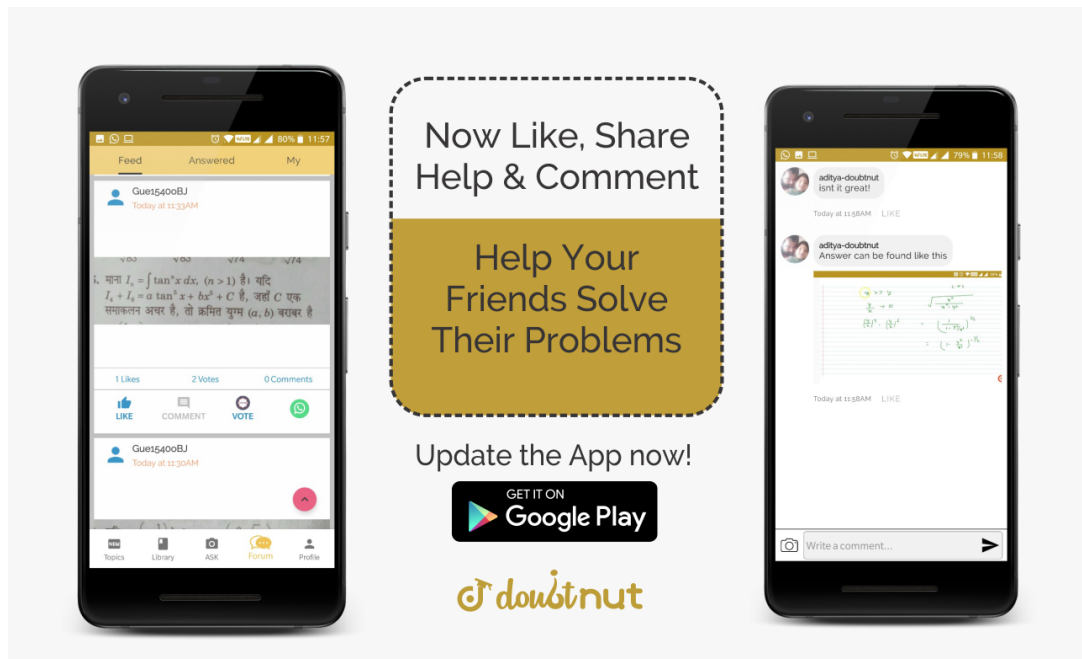
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Write the position vector of the mid-point of the vector joining the points P (2, 3, 4) and Q (4, 1,-2).

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If $\vec{a} \cdot \vec{a} = 0$ and $\vec{a} \cdot \vec{b} = 0$, then what can be concluded about the vector \vec{b} ?


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For what value of p , is $(\hat{i} + \hat{j} + \hat{k})p$ a unit vector?

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Find $|\vec{x}|$, if for a unit vector \vec{a} , $(\vec{x} - \vec{a}) \cdot \vec{x} + \vec{a} = 15$

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If $|\vec{a}| = \sqrt{3} |\vec{b}| = 2$ and $\vec{a} \cdot \vec{b} = \sqrt{3}$, find the angle between \vec{a} and \vec{b}

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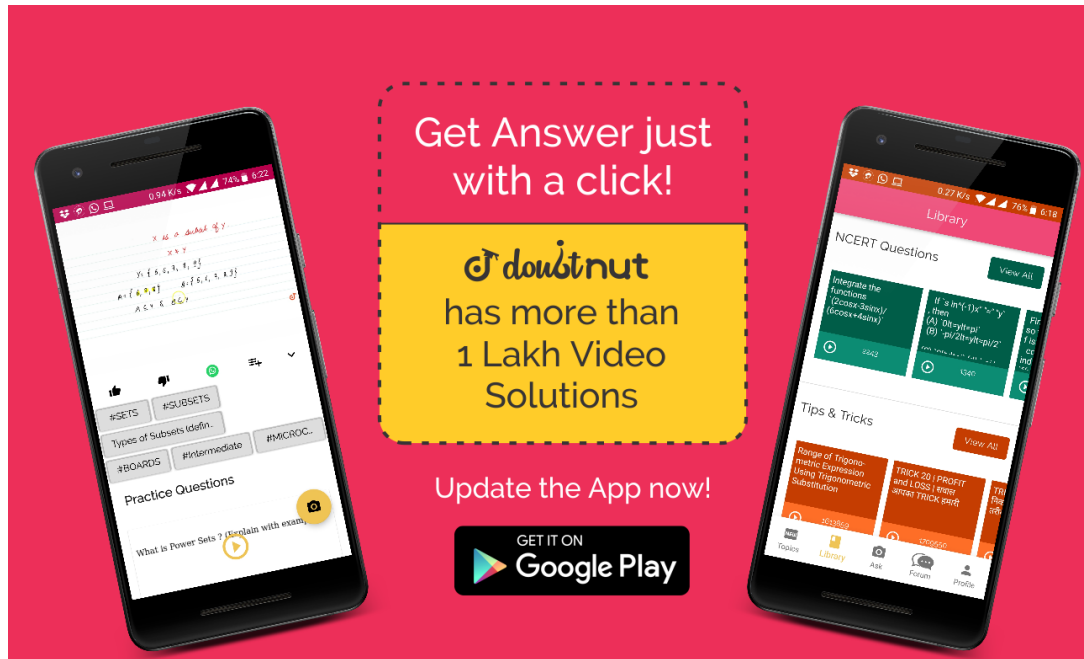
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39 - 10878

Find λ when the projection of $\vec{a} = \lambda\hat{i} + \hat{j} + 4\hat{k}$ on $\vec{b} = 2\hat{i} + 6\hat{j} + 3\hat{k}$ is 4 units.

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40 - 10880

Write the vector equation of the line given by

$$\frac{x - 5}{3} = \frac{y + 4}{7} = \frac{z - 6}{2}$$

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If \vec{a} and \vec{b} are two vectors such that $|\vec{a} + \vec{b}| = |\vec{a}|$, then prove that vector $2\vec{a} + \vec{b}$ is perpendicular to vector \vec{b}

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If \vec{p} is a unit vector and $(\vec{x} - \vec{p}) \cdot (\vec{x} + \vec{p}) = 80$, then

42 - 10896

find $|\vec{x}|$

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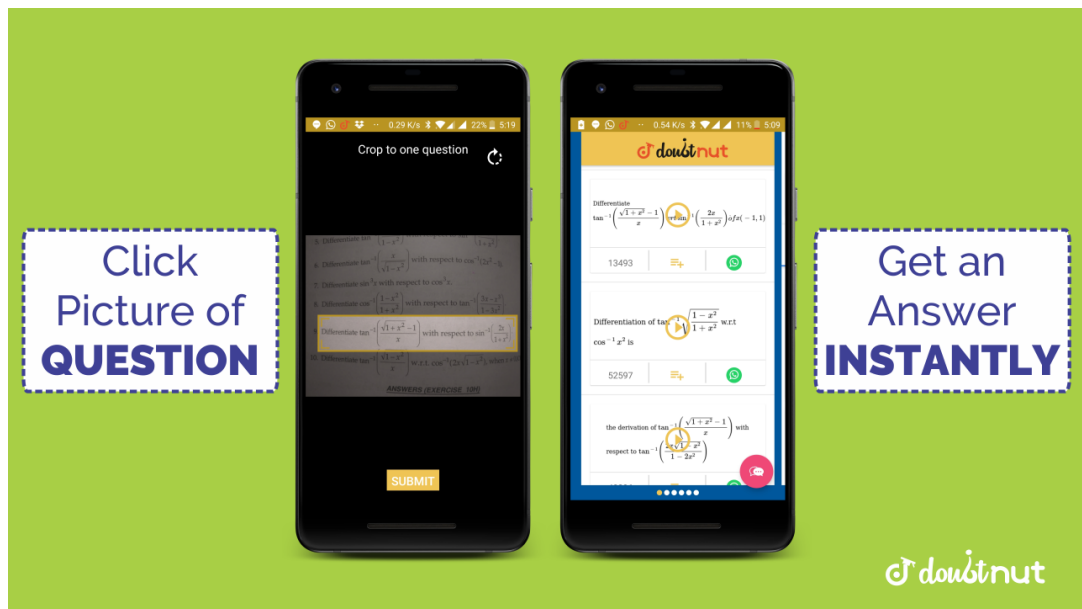
Find the vector equation of the line passing through the point

43 - 10939

$(1,2,3)$ and parallel to the planes $\vec{r} \cdot \hat{i} - \hat{j} + 2\hat{k} = 5$ and $\vec{r} \cdot 3\hat{i} + \hat{j} + \hat{k} = 6$.

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44 - 10943

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If $\vec{a} = \hat{i} - \hat{j} + 7\hat{k}$ and $\vec{b} = 5\hat{j} - \hat{j} + \lambda\hat{k}$, then find the value of λ , so that $\vec{a} + \vec{b}$ and $\vec{a} - \vec{b}$ are perpendicular vectors.

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45 - 10955

The points A(4, 5, 10), B(2, 3, 4) and C (1, 2,-1) are three vertices of a parallelogram ABCD. Find the vector equations of the sides AB and BC and also find the coordinates of point D.

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46 - 10969

The scalar product of the vector $\hat{i} + \hat{j} + \hat{k}$ with the unit vector along the sum of vectors $2\hat{i} + 4\hat{j} - 5\hat{k}$ and $\lambda\hat{i} + 2\hat{j} + 3\hat{k}$ is equal to one. Find the value of λ .

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47 - 10975

If \vec{a} is a unit vector and $(\vec{x} - \vec{a}) \cdot \vec{x} + \vec{a} = 24$, then write the value of $|\vec{x}|$

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48 - 10981

For any three vectors \vec{a} , \vec{b} and \vec{c} , write the value of the following:

$$\vec{a} \times (\vec{b} + \vec{c}) + \vec{b} \times (\vec{c} + \vec{a}) + \vec{c} \times (\vec{a} + \vec{b})$$

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49 - 11000

Let $\vec{a} = \hat{i} + 4\hat{j} + 2\hat{k}$, $\vec{b} = 3\hat{i} - 2\hat{j} + 7\hat{k}$ and $\vec{c} = 2\hat{i} - \hat{j} + 4\hat{k}$. Find a vector \vec{d} which is perpendicular to both \vec{a} and \vec{b} and $\vec{c} \cdot \vec{d} = 18$.

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50 - 11001

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If $\vec{a} = \hat{i} + \hat{j} + \hat{k}$, $\vec{b} = 4\hat{i} - 2\hat{j} + 3\hat{k}$ and $\vec{c} = \hat{i} - 2\hat{j} + \hat{k}$, find a vector of magnitude 6 units which is

parallel to the vector $2\vec{a} - \vec{b} + 3\vec{c}$.

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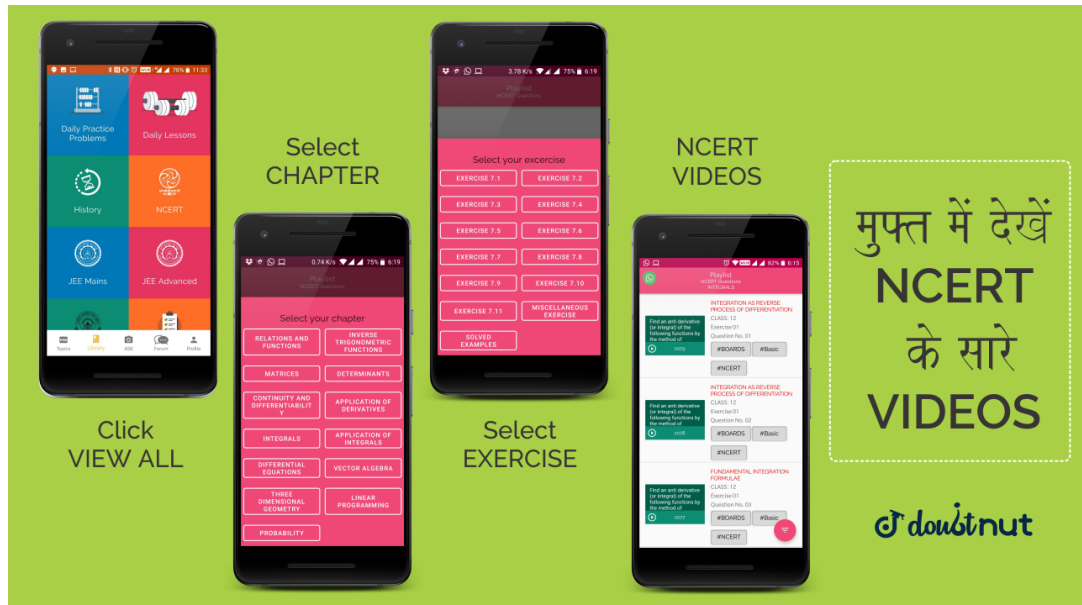
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51 - 11018

Write the projection of the vector $\hat{i} - \hat{j}$ on the vector $\hat{i} + \hat{j}$

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52 - 11028

Find a unit vector perpendicular to each of the vector $\vec{a} + \vec{b}$ and $\vec{a} - \vec{b}$, where $\vec{a} = 3\hat{i} + 2\hat{j} + 2\hat{k}$ and $\vec{b} = \hat{i} + 2\hat{j} - 2\hat{k}$

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53 - 11046

Write the value of the are of the parallelogram determined by the vectors $2\hat{i}$ and $3\hat{j}$.

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54 - 11047

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Write the value of $(\hat{i} \times \hat{j})\hat{k} + (\hat{j} \times \hat{k})\hat{i}$

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55 - 11060

Show that the lines $\vec{r} = 3\hat{i} + 2\hat{j} - 4\hat{k} + \lambda(\hat{i} + 2\hat{j} + 2\hat{k})$;
 $\vec{r} = 5\hat{i} - 2\hat{j} + \mu(3\hat{i} + 2\hat{j} + 6\hat{k})$; are intersecting. Hence find their point of intersection.

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56 - 11068

If \vec{a} , \vec{b} , \vec{c} are three vectors such that $\vec{a} \cdot \vec{b} = \vec{a} \cdot \vec{c}$ and $\vec{a} \times \vec{b} = \vec{a} \times \vec{c}$, $\vec{a} \neq 0$, then show that $\vec{b} = \vec{c}$.

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Find the position vector of a point R which divides the line joining two points P and Q whose position vectors are $\left(2\vec{a} + \vec{b}\right)$ and $\left(\vec{a} - 3\vec{b}\right)$ respectively, externally in the ratio 1:2. Also, show that P is the mid-point of the line segment RQ .

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58 - 11104

The magnitude of the vector product of the vector $\hat{i} + \hat{j} + \hat{k}$ with a unit vector along the sum of vectors $2\hat{i} + 4\hat{j} - 5\hat{k}$ and $\lambda\hat{i} + 2\hat{j} + 3\hat{k}$ is equal to $\sqrt{2}$. Find the value of λ .

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CLASS 12 BOARDS: MOST IMPORTANT QUESTIONS - Chapter 10. VECTOR ALGEBRA

59 - 11107

Find the scalar components of the vector \vec{AB} with initial point $A(2, 1)$ and terminal point $B(-5, 7)$.

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If $|\vec{a}| = 8$, $|\vec{b}| = 3$ and $|\vec{a} \times \vec{b}| = 12$, find the angle between \vec{a} and \vec{b} .

60 - 13234

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