KENDRIYA VIDYALAYA SANGATHAN AHMEDABAD REGION
MATHS WORKSHEET I 2023-24
CLASS: XII
CHAPTER : VECTORS

	MCQS
Q1	The area of a parallelogram whose adjacent sides represented by the vectors $2\hat{\imath} - 3\hat{k}$ and $4\hat{\imath} + 2\hat{\jmath}$ is (a) 10 (b)14 (c) $\sqrt{11}$ (d) $4\sqrt{14}$
Q2	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 (a) 3 (b) 4 (c) -4 (d) -3
Q3	If $\left\|\vec{a} \times \vec{b}\right\|^2 = \left(\vec{a}.\vec{b}\right)^2 = 400$ and $\|\vec{a}\| = 5$ then $\left\|\vec{b}\right\|$ is (a) 3 (b)4 (c) 7 (d)10
Q4	If $\vec{a} = 2\hat{\imath} + 3\hat{\jmath} - 5\hat{k}$ and $\vec{b} = m\hat{\imath} + n\hat{\jmath} + 12\hat{k}$ and $\vec{a} \times \vec{b} = 0$ then (m,n) is (a) $\left(\frac{-24}{5}, \frac{-36}{5}\right)$ (b) $\left(\frac{24}{5}, \frac{36}{5}\right)$ (c) $\left(\frac{24}{5}, \frac{-36}{5}\right)$ (d) $\left(\frac{-24}{5}, \frac{36}{5}\right)$
Q 5	If θ is the angle between any two vectors $\vec{a}$ and $\vec{b}$, then $\left\|\vec{a}.\vec{b}\right\| = \left\|\vec{a} \times \vec{b}\right\|$when θ is equal to (a) 0 (b) $\frac{\pi}{4}$

	(c) $\frac{\pi}{3}$ (d) $\frac{\pi}{6}$
Note	**For Q No 6 to 10 use separate sheet to solve and attach with worksheet.**
Q 6	If $\vec{a}$ and $\vec{b}$ are perpendicular vectors such that $\left\|\vec{a}+\vec{b}\right\| = 13$ and $\|\vec{a}\| = 5$, Find $\|\vec{b}\|$.
Q 7	If $\vec{a} = 2\hat{\imath} + 2\hat{\jmath} + 3\hat{k}$, $\vec{b} = -\hat{\imath} + 2\hat{\jmath} + \hat{k}$ and $\vec{c} = 3\hat{\imath} + \hat{\jmath}$ are such that $\vec{a} + \lambda\vec{b}$ is perpendicular to $\vec{c}$,then find λ.
Q 8	The scalar product of 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.
Q 9	If $\vec{a}$, $\vec{b}$ and $\vec{c}$ are three vectors such that $\|\vec{a}\|$ = 3, $\left\|\vec{b}\right\|$= 4 and $\|\vec{c}\|$= 5 and each one of these is perpendicular to the sum of other two, find $\left\|\vec{a}+\vec{b}+\vec{c}\right\|$.
Q 10	Let $\vec{a} = \hat{\imath} - \hat{\jmath}$, $\vec{b} = 3\hat{\jmath} - \hat{k}$ and $\vec{c} = 7\hat{\imath} - \hat{k}$. Find a vector $\vec{d}$ which is perpendicular to both $\vec{a}$ *and* $\vec{b}$ and $\vec{c}\cdot\vec{d} = 1$.
Q11	If $\vec{a} = \hat{i} + \hat{j} + \hat{k}$, $\vec{c} = \hat{j} - \hat{k}$, then find a vector $\vec{b}$ such that $\vec{a} \times \vec{b} = \vec{c}$ and $\vec{a}.\vec{b}$ = 3.
SPACE For Rough Work :	

KENDRIYA VIDYALAYA SANGATHAN AHMEDABAD REGION
MATHS WORKSHEET II 2023-24
CLASS: XII
CHAPTER : VECTORS

	MCQS
Q1	The area of the parallelogram whose diagonals are $\hat{k} + \hat{\jmath}$and $\hat{k} + \hat{\imath}$ is (a) $\frac{\sqrt{3}}{2}$ (b) $\frac{3}{2}$ (c) 3 (d)$\sqrt{3}$
Q2	If $\|\vec{a}\| = 2$, $\|\vec{b}\| = 5$ and $\|\vec{a} \times \vec{b}\| = 8$,then $\|\vec{a} - \vec{b}\|$ (a) 3 (b) 12 (c) 17 (d) 14
Q3	If $\vec{a} = 7\hat{i} + \hat{j} - 4\hat{k}$ and $\vec{b} = 2\hat{i} - 3\hat{j} + 4\hat{k}$, then the projection of $\vec{a}\ on\ \vec{b}$ is (a) $\frac{1}{7}$ (b) $\frac{5}{7}$ (c) $\frac{8}{7}$ (d) $\frac{9}{7}$
Q4	If $\vec{a}\ and\ \vec{b}$ are two vectors such that $\|\vec{a}\| = \frac{1}{2}$, $\|\vec{b}\| = \frac{4}{\sqrt{3}}$ and $\|\vec{a} \times \vec{b}\| = \frac{1}{\sqrt{3}}$ then find $\|\vec{a}.\vec{b}\|$. (a) 2 (b) 3 (c) 1 (d) 5
Q 5	A vector in the direction of $5\hat{\imath} - \hat{\jmath} + 2\hat{k}$ which has magnitude 8 units is (a) $40\hat{\imath} - 8\hat{\jmath} + 16\hat{k}$ (b) $\frac{40\hat{\imath} - 8\hat{\jmath} + 16\hat{k}}{\sqrt{30}}$

	(c) $\frac{5\hat{\imath}-\hat{\jmath}+2\hat{k}}{\sqrt{30}}$ (d) none of these
	If $\|\vec{a}\| = 2$, $\|\vec{b}\| = 5$ and $\|\vec{a} \times \vec{b}\| = 8$,then $\|\vec{a} - \vec{b}\|$ (a) 3 (b) 12 (c) 17 (d) 14
Note	**For Q No 6 to 10 use separate sheet to solve and attach with worksheet.**
Q 6	Find the area of triangle with vertices (1,1,1), (1,2,3) and (2,3,1)
Q 7	Find a unit vector perpendicular to each of the vectors $\vec{a}$ + $\vec{b}$ and $\vec{a}$ - $\vec{b}$ Where $\vec{a} = \hat{i} + \hat{j} + \hat{k}$ and $\vec{b} = \hat{i} + 2\hat{j} + 3\hat{k}$
Q 8	If $\vec{a}$, $\vec{b}$ and $\vec{c}$ be three vectors such that $\vec{a}$, + $\vec{b}$ + $\vec{c}$ = 0 and$\|\vec{a}\|$ = 3, $\|\vec{b}\| = 5$ &$\|\vec{c}\| = 7$ find the angle between $\vec{a}$, and $\vec{b}$
Q 9	If $\vec{a}$ and $\vec{b}$ are two vectors such that $\|\vec{a}\| = \frac{1}{2}$, $\|\vec{b}\| = \frac{4}{\sqrt{3}}$ and $\|\vec{a} \times \vec{b}\| = \frac{1}{\sqrt{3}}$ then $\|\vec{a} . \vec{b}\|$ find.
Q 10	Three vectors $\vec{a}$, $\vec{b}$ and $\vec{c}$ satisfy the condition $\vec{a} + \vec{b} + \vec{c} = 0$. Evaluate the quantity. $\vec{a}.\vec{b} + \vec{b}.\vec{c} + \vec{c}.\vec{a}$, if $\|\vec{a}\|$ =1, $\|\vec{b}\|$ =4, $\|\vec{c}\|$ =2
Q11	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.
Q12	If $\vec{a} = 3\hat{i} - \hat{j}$ and $\vec{b} = 2\hat{i} + \hat{j} - 3\hat{k}$, then express $\vec{b}$ = $\overrightarrow{b_1}$ + $\overrightarrow{b_2}$ where $\overrightarrow{b_1}$ is parallel to $\vec{a}$ and $\overrightarrow{b_2}$ is perpendicular to $\vec{a}$
SPACE For Rough Work :	