



MATHEMATICS
CH: 10 - VECTORS - WORKSHEET

Name: _____

Date: _____

Class: XII Sec: A

1) $a = i - j + 2k$, $b = -i - 2j + k$

Find a unit vector in the direction of $a + b$.

2) Find the projection of $i + 2j$ on $i + 2j - 2k$.

3) $a = 2i + j + 3k$, $b = i - j - k$, $c = 3i + 2k$

$(a + \lambda b) \perp c$. Find λ .

4) Find the dir. cosines of AB if $A(-1, 2, 3)$ and $B(2, 0, -4)$ are given points.

5) $a = 2i + \lambda j - 3k$, $b = i - 2j + k$. Find λ if $a \perp b$.

6) $a = i + 2j - \lambda k$, $b = 2i + \mu j - 4k$. Find λ, μ if $a \parallel b$.

7) Find a vector of mag. 7 units in the direction of vector $i - 3j + k$.

8) $|a| = 4$, $|b| = 3$, $a \cdot b = 6\sqrt{3}$, find $|a \times b|$.

9) Find $(i \times j) \cdot k + (j \times k) \cdot i + (k \times i) \cdot j$.

10) Find dir. cosines of vector $2i - j + 2k$.

11) $|a| = 1/2$, $|b| = 4/3$, $|a \times b| = 1/\sqrt{3}$, find $|a \cdot b|$.

12) $|a| = 3$, $|b| = \sqrt{3}/2$, $a \times b$ is a u.v. Find angle between a and b .

13) Find λ when projection of $a = \lambda i + j + 4k$ on $b = 2i + 6j + 3k$ is 4 units.

14) A vector makes equal angles with coordinate axes. What is its dir. cos.



INDIAN SCHOOL NIZWA

- 15) $a = 3i + xj$, $b = 2i + yj + k$, $a \perp b$ and $|a| = |b|$. Find x and y .
- 16) $|a| = 10$, $|b| = 2$, $|a \times b| = 16$, find $a \cdot b$.
- 17) Find area of parallelogram whose adjacent sides are $i + k$ and $2i + j + k$.
- 18) Find a vector of mag. 6, $\perp$ to each of $a + b$ and $a - b$, where $a = i + j + k$, $b = i + 2j + 3k$.
- 19) $|a| = 5$, $|b| = 12$, $|c| = 13$, $a + b + c = 0$. Find $a \cdot b + a \cdot c + b \cdot c$.
- 20) $a \cdot b = a \cdot c$ and $a \times b = a \times c$, $a \neq 0$. Prove $b = c$.
- 21) $a = i + j + 2k$, $b = 3i - 2j + 7k$, $c = 2i - j + k$. Find $\bar{p}$ such that $\bar{p} \perp$ to both a and b and $\bar{p} \cdot \bar{c} = 18$.
- 22) The scalar product of the vectors $i + j + k$ with the u.v. along the sum of $2i + 4j - 5k$ and $\lambda i + 2j + 3k$ is equal to one. Find λ .
- 23) a and b are u.v. Find angle b/w a and b if $a - \sqrt{2}b$ is a u.v.
- 24) a and b are u.v. such that $a + 3b$ is $\perp$ to $7a - 5b$. Find angle between a and b .
- 25) a is a u.v. $(2n - 3a) \cdot (2n + 3a) = 91$. Find $|n|$.
- 26) $a = 5i - j + 3k$, $b = i + 3j - 5k$, prove $a + b \perp a - b$.