Ninth Grade - Vector and Matrix Quantities

1) Classify whether the quantity 10 kg is

- Scalar
- Co initial vectors
- Unit
- Vector

2) Classify whether 10 meters north is

- Co intial vectors
- Scalar
- Unit
- Vector

3) Classify whether 10 Newton is

- Unit
- Vector
- Co initial vectors
- Scalar

4) Classify whether 1023 coulomb is

- Scalar
- Vector
- Unit
- Co initial vectors

5) Let a and b are given vectors such that

If \vec{a} and \vec{b} are collinear and are in the same direction then

- 0 ٠
- ab
- 1
- -ab

6) Let a and b are given vectors such that

If \vec{a} and \vec{b} are in the opposite direction then

- -ab ٠
- 0
- 1
- ab

7) Let a and b are given vectors such that

If
$$\vec{a}$$
 and \vec{b} are two nonzero vectors then
a) $\vec{a} \cdot \vec{b} = 0$ b) $\vec{a} \cdot \vec{b} \neq 0$ c) $\vec{a} \propto \vec{b}$ d) $\vec{a} \equiv \vec{b}$
 $\vec{a} = \vec{b}$

• b

8) Find angle between two vectors.

If
$$\vec{a}$$
 and \vec{b} are two vectors such that $\left|\vec{a}\right| = 4$ $\left|\vec{b}\right| = 3$ and $\vec{a} \cdot \vec{b} = 6$



- 1/2
- 1/4
- 1/3

9) Find the projection of the vector.

$$(\vec{r}.\vec{j})\vec{i} + (\vec{r}.\vec{i})\vec{j} + (\vec{r}.\vec{k})\vec{k} (a)\vec{i} (b)\vec{j} (c)\vec{r} (d)\vec{k} \overset{b}{\vdots} \\\overset{c}{\vdots} \\\overset{a}{\vdots}$$

10) Identify the law vectors.

If \vec{a} and \vec{b} represented in magnitude and direction by the two adjacent sides of a parallelogram then their sum \vec{c} is represented by the parallelogram and it is known as

- Quadrilateral law of vectors
- Parallelogram law of vectors
- Law of vectors
- Trapezoidal law of vectors

11) If the following vectors represented by the side of the triangle taken in order by then

If $\vec{a}, \vec{b}, \vec{c}$ be the vectors represented by the sides of a triangle taken in order then a) $\vec{a} + \vec{b} + \vec{c} = 1$ b) $\vec{a} + \vec{b} + \vec{c} = 0$ c) $\vec{a} + \vec{b} + \vec{c} = 2$ d) $\vec{a} + \vec{b} + \vec{c} = 3$

- a
- c
- b
- d

12) Simplify the following vectors.

$$If \left| -m(\vec{a}) \right| = ?$$

a) $-m|\vec{a}| = b$, $m|\vec{a}| = c$, $m\vec{a} = d$, $-m\vec{a}$
• a

- d
- u • b
- c

13) If the diagonals of a parallelogram are equal then it is?

- Rhombus
- Rectangle
- Parallelogram
- Trapezium

14) If the vectors are parallel to the same plane then it is



- Non collinear
- Non coplanar
- Coplanar
- Collinear

15) Which of the following is external section formula?

- C
- d
- b
- a

16) Consider the given vectors a and b.

Find the angle between two vectors \overline{a} and \overline{b} having the same length $\sqrt{2}$ and their scalar product is -1

- ?/2
- 2?/3
- ?/3
- 6?/7

17) Consider the given vectors a and b.

Let \vec{a} and \vec{b} be two vectors of the same magnitude such that the angle between them is 60° \vec{a} . $\vec{b} = 8$. Find $|\vec{a}|$ and $|\vec{b}|$

- 5
- 8
- 4
- 3

18) Consider the given vectors a and b.

If
$$\vec{a} = 5\vec{i} - \vec{j} - 3\vec{k}$$
 $\vec{b} = \vec{i} + 3\vec{j} - 5\vec{k}$
then the vectors $(\vec{a} + \vec{b}) \cdot (\vec{a} - \vec{b})$ is

- Perpendicular
- Collinear
- Parallel
- Non parallel

19) Consider the given vectors a and b.

Find $\vec{a} \times \vec{b}$ if $\vec{a} = 2\vec{i} + \vec{k}$ $\vec{b} = \vec{i} + \vec{j} + \vec{k}$ (a) $-\vec{i} - \vec{j} + 2\vec{k}$ (b) $-\vec{j} - \vec{j} + 6\vec{k}$ (c) $-\vec{i} - \vec{i} - 8\vec{k}$ (d) $\vec{k} + \vec{j} - 2\vec{k}$

- a
- b • d
- u

20) Let ab given vectors then

Find the magnitude $\vec{a} \cdot \vec{a} = (\vec{i} + \vec{j} + \vec{k}) \times (-\vec{i} + 3\vec{k})$

- ?93
- ?91
- ?95
- ?99

21) From the product of given two vectors.

Find λ and μ if $(2\vec{i}+6\vec{j}+27\vec{k}) * (\vec{i}+\lambda\vec{j}+\mu\vec{k})$



- 5, 57/2
- 3, 97/7
- 7, 17/2
 3, 27/2
- 3, 27/2

22) Given magnitude and product of two vectors then

If two vectors \vec{a} and \vec{b} are such that $|\vec{a}| = 3$ $|\vec{b}| = 2$ $\vec{a} \cdot \vec{b} = 6$ Find $|\vec{a} + \vec{b}|$ $\hat{\vec{a}} = \hat{\vec{a}}$

23) Let a and b are two vectors.

Find the values of x for which $\vec{a} = 2x^2\vec{i} + 4x\vec{j} + \vec{k}$ and $\vec{b} = 7\vec{i} - 2\vec{j} + x\vec{k}$ is obtuse

- 0 7/2 • 0
- 0
- 0 >x > 1/3

24) For the given vectors.

Find the projection $7\vec{i} + \vec{j} - 4\vec{k}$ on $2\vec{i} + 6\vec{j} + 3\vec{k}$

- 4/7
- 5/9
- 5/7
- 8/7

25) Here which of the following represents the linear combination of vectors?

a)
$$\vec{r} = x\vec{a} + y\vec{b} + z\vec{c}$$
 b) $\vec{r} = x\vec{a} - y\vec{b}$ c) $\vec{r} = x\vec{a}$ d) None

- Both 2 and 4
- Both 1 and 2
- Both 2 and 3
- Both 1 and 2

26) Find the unit vector parallel to the vector?

$$-3\vec{i} + 4\vec{j}$$

a) $(3/5)\vec{i} + (4/5)\vec{j}$ b) $(3/5)\vec{i} - (4/5)\vec{j}$ c) $-(3/5)\vec{i} + (4/5)\vec{j}$ d) $(3/5)\vec{i} + (4)\vec{j}$

- d
- c
- b
- a

27) Find the magnitude of vector?

$$2\vec{i}-\vec{j}$$

- 6
- 9
- 7
- 5

28) Find the value of x, y, z

$$\vec{a} = x\vec{i} + y\vec{i} + z\vec{j}$$
 $\vec{b} = 2\vec{i} + y\vec{j} + \vec{k}$ are equal
• (-2, -2, -1)



- (-2, -2, 1)
 (5, 7, 1)
 (2, 2, 1)

29) Find the magnitude of

$$\vec{a} = 3\vec{i} - 6\vec{j} + 2\vec{k}$$

$$\vec{a} = 3\vec{i} - 6\vec{j} + 2\vec{k}$$

30) How can we define.

$$\vec{a} \times \vec{b}$$

 $a) \vec{a} \times \vec{b} = |\vec{a}| |\vec{b}| \cos \theta$ $b) \vec{a} \times \vec{b} = \cos \theta$
 $c) \vec{a} \times \vec{b} = |\vec{a}| |\vec{b}| \sin \theta$ $d) \vec{a} \times \vec{b} = |\vec{a}| |\vec{b}|$

- b
- а •
- C
- d