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
- Vector
- Unit
- Scalar

3) Classify whether 10 Newton is

- Vector
- Scalar
- Co initial vectors
- Unit

4) Classify whether 10^{23} coulomb is

- Co initial vectors
- Vector
- Unit
- Scalar

5) Let a and b are given vectors such that

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

- 1
- ab
- 0
- -ab

6) Let a and b are given vectors such that

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

- ab
- 1
- -ab
- 0

7) Let a and b are given vectors such that

$If\ \vec{a}\ and\ \vec{b}\ are\ two\ non\ zero\ vectors\ then$

$a)\ \vec{a}\ .\ \vec{b}\ =0 \quad b)\ \vec{a}\ .\ \vec{b}\neq 0 \quad c)\ \vec{a}\propto\vec{b} \quad d)\ \vec{a}\equiv\vec{b}$

- a
- b
- d
- c

8) Find angle between two vectors.

$If\ \vec{a}\ and\ \vec{b}\ are\ two\ vectors\ such\ that$

$\left|\vec{a}\right|=4 \quad \left|\vec{b}\right|=3\ and\ \vec{a}.\vec{b}=6$

- 1/3

- 1/2
- 1/8
- 1/4

9) Find the projection of the vector.

$$\left(\vec{r}.\vec{j}\right)\vec{i}+\left(\vec{r}.\vec{i}\right)\ \vec{j}+\left(\vec{r}.\vec{k}\right)\vec{k}$$

$$(a)\ \vec{i}\quad (b)\ \vec{j}\quad (c)\ \vec{r}\quad (d)\ \vec{k}$$

- b
- d
- c
- a

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
- Trapezoidal law of vectors
- Parallelogram law of vectors
- 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
- d
- b
- c

12) Simplify the following vectors.

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

$a)\ -m\left|\vec{a}\right|$ $b)\ m\left|\vec{a}\right|$ $c)\ m\vec{a}$ $d)\ -m\vec{a}$

- b
- d
- c
- a

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

- Trapezium
- Parallelogram
- Rectangle
- Rhombus

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

- Coplanar
- Non collinear
- Non coplanar
- Collinear

15) Which of the following is external section formula?

- d
- a
- c
- b

16) Consider the given vectors a and b.

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

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

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° $\vec{a} \cdot \vec{b} = 8$. Find $|\vec{a}|$ and $|\vec{b}|$

- 8
- 4
- 5
- 3

18) Consider the given vectors a and b.

$$\text{If } \vec{a} = 5\vec{i} - \vec{j} - 3\vec{k} \quad \vec{b} = \vec{i} + 3\vec{j} - 5\vec{k}$$

$$\text{then the vectors } (\vec{a} + \vec{b}).(\vec{a} - \vec{b}) \text{ is}$$

- Non parallel
- Parallel
- Collinear
- Perpendicular

19) Consider the given vectors a and b.

$$\text{Find } \vec{a} \times \vec{b} \text{ if } \vec{a} = 2\vec{i} + \vec{k} \quad \vec{b} = \vec{i} + \vec{j} + \vec{k}$$

$$(a)\ -\vec{i} - \vec{j} + 2\vec{k} \quad (b)\ -\vec{j} - \vec{j} + 6\vec{k} \quad (c)\ -\vec{i} - \vec{i} - 8\vec{k} \quad (d)\ \vec{k} + \vec{j} - 2\vec{k}$$

- b
- c
- d
- a

20) Let ab given vectors then

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

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

21) From the product of given two vectors.

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

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

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 $|\vec{a} + \vec{b}|$

- 2
- 9
- 6
- 5

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 >x > 1/ 3
- 0
- 0 7/ 2
- 0

24) For the given vectors.

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

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

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

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

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

26) Find the unit vector parallel to the vector?

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

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

- b
- c
- a
- d

27) Find the magnitude of vector?

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

- 9
- 5
- 6
- 7

28) Find the value of x, y, z

$\vec{a} = x\vec{i} + y\vec{i} + z\vec{j} \quad \vec{b} = 2\vec{i} + y\vec{j} + \vec{k}$ are equal

- (2 , 2 , 1)

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

29) Find the magnitude of

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

- 3
- 9
- 7
- 5

30) How can we define.

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

$$a)\ \ \vec{a}\times\vec{b} = \left|\vec{a}\right|\ \left|\vec{b}\right|\cos\theta \qquad b)\ \ \vec{a}\times\vec{b} = \cos\theta$$

$$c)\ \ \vec{a}\times\vec{b} = \left|\vec{a}\right|\ \left|\vec{b}\right|\sin\theta \qquad d)\ \ \vec{a}\times\vec{b} = \left|\vec{a}\right|\ \left|\vec{b}\right|$$

- d
- b
- a
- c