Ninth Grade - Vector and Matrix Quantities

1) Classify whether the quantity 10 kg is

- Unit
- Co initial vectors
- Vector
- Scalar

2) Classify whether 10 meters north is

- Scalar
- Co intial vectors
- Unit
- Vector

3) Classify whether 10 Newton is

- Scalar
- Co initial vectors
- Vector
- Unit

4) Classify whether 10^{23} coulomb is

- Scalar
- Co initial vectors
- Vector
- Unit

5) Let a and b are given vectors such that

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

- -ab
- 0
- 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
- 0
- 1
- ab

7) Let a and b are given vectors such that

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

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

- d
- c
- b
- a

8) Find angle between two vectors.

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

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

- 1/2

- 1/4
- 1/8
- 1/3

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

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

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
- a
- c
- d

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

- Trapezium
- Rhombus
- Parallelogram
- Rectangle

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

- Non collinear
- Coplanar
- Collinear
- Non coplanar

15) Which of the following is external section formula?

- a
- d
- b
- c

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

- 2?/3
- ?/3
- ?/2
- 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 $60°$ $\vec{a} \cdot \vec{b} = 8$. Find $\left|\vec{a}\right|$ and $\left|\vec{b}\right|$

- 3
- 4
- 5
- 8

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 $(\vec{a} + \vec{b}).(\vec{a} - \vec{b})$ is

- Non parallel
- Perpendicular
- Collinear
- Parallel

19) Consider the given vectors a and b.

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

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

- b
- c
- a
- d

20) Let ab given vectors then

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

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

21) From the product of given two vectors.

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

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

22) Given magnitude and product of two vectors then

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

$$|\vec{a}| = 3 \quad |\vec{b}| = 2 \quad \vec{a} \cdot \vec{b} = 6 \quad \text{Find} \quad |\vec{a} + \vec{b}|$$

- 9
- 2
- 5
- 6

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

24) For the given vectors.

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

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

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

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

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

26) Find the unit vector parallel to the vector?

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

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

- c
- d
- a
- b

27) Find the magnitude of vector?

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

- 5
- 9
- 6
- 7

28) Find the value of x, y, z

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

- (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
- 5
- 7

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
- a
- c
- b