Answer on Question #52234 – Math – Vector Calculus

1) What are the component of a vector

I,x,k

I,j,k

y,x,i

w,I,k

ANSWER:

I,j,k

7) If

r4=r1+r2+r3

,which of the vectors are linearly dependent .

r1

r3

r4

r2

ANSWER:

Def.

Vectors $a_1, a_2, \ldots, a_n$ are linearly dependent if there exist scalars (real numbers) $k_1, k_2, \ldots, k_n$, not all of which are zero, such that their linear combination

$k_1a_1 + k_2a_2 + \cdots + k_na_n = 0.$

This problem deals with r1+r2+r3- r4=0

Vectors $a_1, a_2, \ldots, a_n$ are linearly independent if the equation

$k_1a_1 + k_2a_2 + \cdots + k_na_n = 0$ can only be satisfied by $k_1 = 0, k_2 = 0, \ldots, k_n = 0.$

Thus, vectors r1,r2, r3, r4 are linearly dependent.

8) If u.v=v.u,what does the law conotes;

associative

commutative

distributive

scalar

ANSWER:

commutative

9) A dot product is said to be distributive,if ……..

m.u=u.m

m(u.v)=v(m.v)

u.(v+w)=(u.v+u.w)

m=u

ANSWER:

$m \cdot u = u \cdot m$ - commutative
$m(u \cdot v) = v(m \cdot v)$ - associative
$u \cdot (v+w) = (u \cdot v + u \cdot w)$ - distributive
$m = u$ - scalar

10) Given that :
$r1 = 6i - 8j + 2k$,

$r2 = 4i + 5j + 7k$,

$r3 = -2i + j + 6k$ is a vector.

Find $r1r2$
30
26
-26
19

ANSWER:

The dot product $r1r2 = 6 \cdot 4 + (-8) \cdot 5 + 2 \cdot 7 = 24 - 40 + 14 = -2$