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Unit 3 - Week 1

Assignment 1

The due date for submitting this assignment has passed. **Due on 2018-02-05, 23:59 IST.**

Submitted assignment

Evaluate the following identities using indicial notation:

1) δ_{ii} = _____

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 3

2 points

2) $\delta_{ij}\delta_{ij}$ = _____

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 3

2 points

3) $\delta_{ij}a_j$ = _____

Hint

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) ai

2 points

4) $\delta_{ij}a_{jk}$ = _____

Hint

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) aik
(Type: String) ajk

2 points

5) $\delta_{ij}a_{kj}$ = _____

Hint

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) aki
(Type: String) akj

2 points

6) $\delta_{ij}a_{ij}$ = _____

Hint

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) aii
(Type: String) ajj

2 points

7) $\delta_{ij}\delta_{jk}\delta_{ik}$ = _____

Hint

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 3

2 points

8) $\delta_{ik}\delta_{jm}\delta_{ij}\delta_{km}$ = _____

Hint

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 3

2 points

9) $\delta_{ij}\in_{ijk}$ = _____

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 0

2 points

10)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 6

2 points

Evaluate the following identities written using indicial notation for the conditions given:

11 If $a_{ij} = a_{ji}$, $\in_{ijk} a_{jk}$ = _____

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 0

2 points

12)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 0

2 points

13 If $c_i = A_{ij}b_j - D_{in}b_n = B_{ij}b_j$, then B_{ij} = _____

Hint

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) Aij-Dij

2 points

14 Let, $f(x_i) = m\,x_i + c_i$ where 'm' is a scalar. If $f(x_i)$ were to be a linear function of x_i then c_1 = _____

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 0

2 points

15 Let, $f(x_i) = m\,x_i + c_i$ where 'm' is a scalar. If $f(x_i)$ were to be a linear function of x_i then c_2 = _____

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 0

2 points

16 Let, $f(x_i) = m\,x_i + c_i$ where 'm' is a scalar. If $f(x_i)$ were to be a linear function of x_i then c_3 = _____

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 0

2 points

17 Let $\mathbf{a} = 12\mathbf{e}_x + 4\mathbf{e}_y + 3\mathbf{e}_z$, $\mathbf{b} = 5\mathbf{e}_x + 6\mathbf{e}_y + \mathbf{e}_z$, then compute the following:

accurately up to the second decimal place:
Magnitude of a is _____

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 13

4 points

18 Let $\mathbf{a} = 12\mathbf{e}_x + 4\mathbf{e}_y + 3\mathbf{e}_z$, $\mathbf{b} = 5\mathbf{e}_x + 6\mathbf{e}_y + \mathbf{e}_z$, then compute the following:

accurately up to the second decimal place:
Component of the vector a along the direction of b is _____

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 10.9, 11.1

4 points

19 Let $\mathbf{a} = 12\mathbf{e}_x + 4\mathbf{e}_y + 3\mathbf{e}_z$, $\mathbf{b} = 5\mathbf{e}_x + 6\mathbf{e}_y + \mathbf{e}_z$, then compute the following:

accurately up to the second decimal place:
Angle between the vectors, a and b is _____ degrees

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 31.7, 31.9

4 points

20 Let $\mathbf{a} = 12\mathbf{e}_x + 4\mathbf{e}_y + 3\mathbf{e}_z$, $\mathbf{b} = 5\mathbf{e}_x + 6\mathbf{e}_y + \mathbf{e}_z$, then compute the following:

accurately up to the second decimal place:

Length of the diagonal of the parallelogram whose sides are a and b is _____

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 20.0, 20.2

4 points

21 Let $\mathbf{a} = 12\mathbf{e}_x + 4\mathbf{e}_y + 3\mathbf{e}_z$, $\mathbf{b} = 5\mathbf{e}_x + 6\mathbf{e}_y + \mathbf{e}_z$, then compute the following:

accurately up to the second decimal place:

The orientation of the diagonal of the parallelogram whose sides are **a** and **b** with respect to the $\mathbf{e}_x$ direction is _____ degrees

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 32.2, 32.4

4 points

22 Let $\mathbf{a} = 12\mathbf{e}_x + 4\mathbf{e}_y + 3\mathbf{e}_z$, $\mathbf{b} = 5\mathbf{e}_x + 6\mathbf{e}_y + \mathbf{e}_z$, then compute the following:

accurately up to the second decimal place:

The orientation of the diagonal of the parallelogram whose sides are **a** and **b** with respect to the $\mathbf{e}_y$ direction is _____ degrees

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 60.1, 60.3

4 points

23 Let $\mathbf{a} = 12\mathbf{e}_x + 4\mathbf{e}_y + 3\mathbf{e}_z$, $\mathbf{b} = 5\mathbf{e}_x + 6\mathbf{e}_y + \mathbf{e}_z$, then compute the following:

accurately up to the second decimal place:

The orientation of the diagonal of the parallelogram whose sides are **a** and **b** with respect to the $\mathbf{e}_z$ direction is _____ degrees

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 78.4, 78.6

4 points

24 Let $\mathbf{a} = 12\mathbf{e}_x + 4\mathbf{e}_y + 3\mathbf{e}_z$, $\mathbf{b} = 5\mathbf{e}_x + 6\mathbf{e}_y + \mathbf{e}_z$, then compute the following:

accurately up to the second decimal place:

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 0.25, 0.27

4 points

25 Let $\mathbf{a} = 12\mathbf{e}_x + 4\mathbf{e}_y + 3\mathbf{e}_z$, $\mathbf{b} = 5\mathbf{e}_x + 6\mathbf{e}_y + \mathbf{e}_z$, then compute the following:

accurately up to the second decimal place:

The component of the unit vector which is perpendicular to the plane containing the vectors **a** and **b** along $\mathbf{e}_y$ direction is ±_____

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 0.04, 0.06

4 points

26 Let $\mathbf{a} = 12\mathbf{e}_x + 4\mathbf{e}_y + 3\mathbf{e}_z$, $\mathbf{b} = 5\mathbf{e}_x + 6\mathbf{e}_y + \mathbf{e}_z$, then compute the following:

accurately up to the second decimal place:

The component of the unit vector which is perpendicular to the plane containing the vectors **a** and **b** along $\mathbf{e}_z$ direction is ±_____

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 0.95, 0.97

4 points

27 Let $\mathbf{a} = 12\mathbf{e}_x + 4\mathbf{e}_y + 3\mathbf{e}_z$, $\mathbf{b} = 5\mathbf{e}_x + 6\mathbf{e}_y + \mathbf{e}_z$, then compute the following:

accurately up to the second decimal place:

Area of the parallelogram whose sides are **a** and **b** is _____

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 53.8, 54.0

4 points

28 Let $\mathbf{a} = 12\mathbf{e}_x + 4\mathbf{e}_y + 3\mathbf{e}_z$, $\mathbf{b} = 5\mathbf{e}_x + 6\mathbf{e}_y + \mathbf{e}_z$, then compute the following:

accurately up to the second decimal place:

Volume of a parallelepiped whose sides are, **a**, **b** and **a** Λ **b** is _____

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 2908.9, 2909.1

4 points

29)

Let $\{e_i\}$ and $\{\tilde{e}_j\}$ represent 2 right handed Cartesian coordinate set of basis vector related through the equations: $\tilde{e}_x = 0.6e_x + 0.8\,e_y$, $\tilde{e}_y = -0.8e_x + 0.6e_y$, $\tilde{e}_z = e_z$. If a vector $\mathbf{u} = 3e_x + 4e_y + 5\,e_z$, then the components of $\mathbf{u}$ for the $\{\tilde{e}_j\}$ basis is:

computed accurately up to first decimal place

$\tilde{u}_x$ = _____

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) -1.5, -1.3

5 points

30)

Let $\{e_i\}$ and $\{\tilde{e}_j\}$ represent 2 right handed Cartesian coordinate set of basis vector related through the equations: $\tilde{e}_x = 0.6e_x + 0.8\,e_y$, $\tilde{e}_y = -0.8e_x + 0.6e_y$, $\tilde{e}_z = e_z$. If a vector $\mathbf{u} = 3e_x + 4e_y + 5\,e_z$, then the components of $\mathbf{u}$ for the $\{\tilde{e}_j\}$ basis is:

computed accurately up to first decimal place

$\tilde{u}_y$ = _____

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 4.7, 4.9

5 points

31)

Let $\{e_i\}$ and $\{\tilde{e}_j\}$ represent 2 right handed Cartesian coordinate set of basis vector related through the equations: $\tilde{e}_x = 0.6e_x + 0.8\,e_y$, $\tilde{e}_y = -0.8e_x + 0.6e_y$, $\tilde{e}_z = e_z$. If a vector $\mathbf{u} = 3e_x + 4e_y + 5\,e_z$, then the components of $\mathbf{u}$ for the $\{\tilde{e}_j\}$ basis is:

computed accurately up to first decimal place

$\tilde{u}_z$ = _____

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 4.9, 5.1

5 points

32)

Let $\{e_i\}$ and $\{\tilde{e}_j\}$ represent 2 right handed Cartesian coordinate set of basis vector related through the equations: $\tilde{e}_x = 0.6e_x + 0.8\,e_y$, $\tilde{e}_y = -0.8e_x + 0.6e_y$, $\tilde{e}_z = e_z$. If a vector $\mathbf{u} = 3e_x + 4e_y + 5\,e_z$, then the components of $\mathbf{u}$ for the $\{\tilde{e}_j\}$ basis is:

computed accurately up to first decimal place

The $\{\tilde{e}_j\}$ basis is obtained by rotating the $\{e_i\}$ basis by _____ degrees in the counter clockwise direction.

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 53.0, 53.2

5 points

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