Question **11**

Correct

Mark 1.00 out of 1.00

Flag question

Find values of b such that the vectors $< -11, b, 2 >$ and $< b, b^2, b >$ are orthogonal

(a) 0, 3, -3 (b) 0, 11, 3 (c) 0, -11, 2
(d) 0, 2, -2 (e) 0, 11, 2

- a. a ✔
- b. b
- c. c
- d. d
- e. e

The correct answer is:
a

Question **12**

Correct

Mark 1.00 out of 1.00

Flag question

The equation of the sphere with center $(4, -1, 3)$ and radius $\sqrt{5}$ is

(a) $(x-4)^2+(y+1)^2+(z-3)^2 = 5$ (b) $(x-4)^2+(y+1)^2+(z-3)^2 = 25$
(c) $(x-4)^2+(y+1)^2+(z-3)^2 = \sqrt{5}$ (d) $(x+4)^2+(y-1)^2+(z+3)^2 = 5$
(e) $(x-4)^2+(y-1)^2+(z-3)^2 = 5$

- a. a ✔
- b. b
- c. c
- d. d
- e. e

The correct answer is:
a

Question **13**

Correct

Mark 1.00 out of 1.00

Flag question

There is a vector $\mathbf{v}$ such that

$$\mathbf{v} \times \langle 1, 1, 1 \rangle = \langle 1, 2, 3 \rangle.$$

Select one:

- True
- False ✔

Question 10

Correct

Mark 1.00 out of 1.00

Flag question

Let $\mathbf{u} = \langle 2, 1, 2 \rangle$ and $\mathbf{v} = \langle 6, -3, 2 \rangle$. Find $\cos\theta$ where θ is the angle between $\mathbf{u}$ and $\mathbf{v}$.

A. $-\frac{21}{13}$

B. $-\frac{13}{21}$

C. $\frac{4}{7}$

D. $\frac{13}{21}$

E. $\frac{19}{21}$

- a. A
- b. B
- c. C
- d. D ✔
- e. E

The correct answer is:
D

Question 9

Correct

Mark 1.00 out of 1.00

Flag question

Find the unit vector that is in the same direction as $\mathbf{u} + \mathbf{v}$ when $\mathbf{u} = \langle 3, 7 \rangle$ and $\mathbf{v} = \langle 1, -4 \rangle$.

A. $\left\langle \frac{4}{7}, \frac{3}{7} \right\rangle$

B. $\left\langle \frac{4}{5}, \frac{3}{5} \right\rangle$

C. $\left\langle -\frac{4}{5}, -\frac{3}{5} \right\rangle$

D. $\langle 4, 3 \rangle$

E. $\langle -4, -3 \rangle$

a. A

b. B ✔

c. C

d. D

e. E

The correct answer is:
B

Question 6

Correct

Mark 1.00 out of 1.00

Flag question

Find the component of the vector $\overrightarrow{P_1P_2}$

where $P_1(4,1,-3), P_2(9,1,-3)$

a. $< 5,0,-6 >$

b. $< -5,0,0 >$

c. $< 5,0,0 >$ ✔

d. $< 5,0,6 >$

The correct answer is:
$< 5,0,0 >$

Question 7

Correct

Mark 1.00 out of 1.00

Flag question

Find the norm (Length) of the vector $\vec{a} = 3i + 4j + \sqrt{11}k$

a. 6 ✔

b. 5

c. 4

d. $\sqrt{7+\sqrt{11}}$

The correct answer is:
6

Question 8

Correct

Mark 2.00 out of 2.00

Flag question

Let $\vec{a} = i + 3j - k, \vec{b} = 2i + j + 2k$ be two vectors then $Comp_{\vec{b}}\vec{a}, Proj_{\vec{b}}\vec{a}$ equals

a. $Comp_{\vec{b}}\vec{a} = 1, Proj_{\vec{b}}\vec{a} = \langle \frac{2}{3}, \frac{-1}{3}, \frac{2}{3} \rangle$

b. $Comp_{\vec{b}}\vec{a} = 1, Proj_{\vec{b}}\vec{a} = \langle \frac{2}{3}, \frac{1}{3}, \frac{2}{3} \rangle$ ✔

c. $Comp_{\vec{b}}\vec{a} = 1, Proj_{\vec{b}}\vec{a} = \langle \frac{-2}{3}, \frac{1}{3}, \frac{-2}{3} \rangle$

d. $Comp_{\vec{b}}\vec{a} = 2, Proj_{\vec{b}}\vec{a} = \langle \frac{2}{3}, \frac{1}{3}, \frac{2}{3} \rangle$

The correct answer is:
$Comp_{\vec{b}}\vec{a} = 1, Proj_{\vec{b}}\vec{a} = \langle \frac{2}{3}, \frac{1}{3}, \frac{2}{3} \rangle$

Question 3

Correct

Mark 4.00 out of 4.00

Flag question

Determine whether the following vectors are parallel, perpendicular or neither.

$\langle 1,1,1\rangle$ and $\langle 2,1,2\rangle \times \langle 1,0,1\rangle$	Perpendicular ✔
$< 1,3,7 >, < 3,9,21 >$	Parallel ✔
$2\,\mathbf{i} + \mathbf{j} - 4\,\mathbf{k}$ and $-14\,\mathbf{i} + 7\,\mathbf{j} + 14\,\mathbf{k}$.	Neither parallel nor perpendicular ✔
$\langle 2,-3,1\rangle$ and $\langle 2,1,-1\rangle$.	Perpendicular ✔

The correct answer is:

$\langle 1,1,1\rangle$ and $\langle 2,1,2\rangle \times \langle 1,0,1\rangle$ → Perpendicular,

\(< 1 , 3 , 7 > , < 3 , 9 , 21 > \)

→ Parallel,

$2\,\mathbf{i} + \mathbf{j} - 4\,\mathbf{k}$ and $-14\,\mathbf{i} + 7\,\mathbf{j} + 14\,\mathbf{k}$. → Neither parallel nor perpendicular,

$\langle 2,-3,1\rangle$ and $\langle 2,1,-1\rangle$. → Perpendicular

Question 4

Correct

Mark 2.00 out of 2.00

Flag question

For which (real) values of a are the vectors $\langle 1,a,2\rangle$ and $\langle a,4,4\rangle$

parallel?	2 ✔
perpendicular?	-8/5 ✔

The correct answer is:

parallel? → 2,

perpendicular? → -8/5

Question 5

Correct

Mark 2.00 out of 2.00

Flag question

The equation of a sphere is given by: $x^2 + y^2 + z^2 = 2x - 4y$. Find the center and radius of the sphere.

center	(1,-2,0) ✔
radius	\(\sqrt5 \) ✔

Question 6

Correct

Mark 1.00 out of 1.00

Flag question

Find the component of the vector $\overrightarrow{P_1P_2}$

where $P_1(4,1,-3), P_2(9,1,-3)$

a. $< 5,0,-6 >$

b. $< -5,0,0 >$

c. $< 5,0,0 >$ ✔

d. $< 5,0,6 >$

The correct answer is:
$< 5,0,0 >$

Question 7

Correct

Mark 1.00 out of 1.00

Flag question

Find the norm (Length) of the vector $\vec{a} = 3i + 4j + \sqrt{11}k$

a. 6 ✔

b. 5

c. 4

d. $\sqrt{7+\sqrt{11}}$

The correct answer is:
6

Question 8

Correct

Mark 2.00 out of 2.00

Flag question

Let $\vec{a} = i + 3j - k, \vec{b} = 2i + j + 2k$ be two vectors then $Comp_{\vec{b}}\vec{a}, Proj_{\vec{b}}\vec{a}$ equals

a. $Comp_{\vec{b}}\vec{a} = 1, Proj_{\vec{b}}\vec{a} = \langle \frac{2}{3}, \frac{-1}{3}, \frac{2}{3} \rangle$

b. $Comp_{\vec{b}}\vec{a} = 1, Proj_{\vec{b}}\vec{a} = \langle \frac{2}{3}, \frac{1}{3}, \frac{2}{3} \rangle$ ✔

c. $Comp_{\vec{b}}\vec{a} = 1, Proj_{\vec{b}}\vec{a} = \langle \frac{-2}{3}, \frac{1}{3}, \frac{-2}{3} \rangle$

d. $Comp_{\vec{b}}\vec{a} = 2, Proj_{\vec{b}}\vec{a} = \langle \frac{2}{3}, \frac{1}{3}, \frac{2}{3} \rangle$

The correct answer is:
$Comp_{\vec{b}}\vec{a} = 1, Proj_{\vec{b}}\vec{a} = \langle \frac{2}{3}, \frac{1}{3}, \frac{2}{3} \rangle$