Vectors Test 2A

Name: _____

7   8   9   10   11   **12**

Navigator   Assessment   Student   30 min

Question: 1

A vector of magnitude 6 in the opposite direction to: $a = 12i - 6j + 12k$

a) $2(2i - j + 2k)$

b) $2(-2i + j - 2k)$

c) $6(-2i + j - 2k)$

d) $12(4i - 2j + 4k)$

e) $12(2i - j + 2k)$

Question: 2

In the cube below, P is the midpoint of HG. Vector AP can be written as:

a) $h - \frac{1}{2}(a - b)$

b) $\frac{1}{2}(a + e + h)$

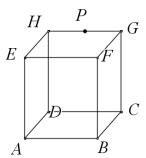c) $h + \frac{1}{2}b - \frac{3}{2}a$

d) $h + \frac{1}{2}(a + b)$

e) $\frac{3}{2}a + \frac{1}{2}b + e + h$

$a = OA$ $e = OE$

$b = OB$ $h = OH$

Question: 3

Vector $a = 3i + mj + nk$ is perpendicular to vector $b = 4i + 2j + 4k$ and $c = 5i + j + k$ the values of m and n are:

a) $m = -24$
    $n = 9$

b) $m = 9$
    $n = -24$

c) $m = -22.5$
    $n = 8.5$

d) $m = 8.5$
    $n = -22.5$

e) None of these

Question: 4

The scalar resolute of $a = 3i + 3k$ in the direction of $b = 2i + j + 2k$ is:

a) $2\sqrt{2}$

b) $2\sqrt{2}(2i + j + 2k)$

c) $2\sqrt{2}(3i + 3k)$

d) 4

e) $4(2i + j + k)$

TEXAS INSTRUMENTS

Question: 5

The angle between vector $\underset{\sim}{a} = 3\underset{\sim}{i} + 3\underset{\sim}{k}$ and vector $\underset{\sim}{b} = 2\underset{\sim}{i} + 2\underset{\sim}{j} + n\underset{\sim}{k}$ is $\dfrac{\pi}{3}$, the value of n is therefore:

a) 2 b) $\dfrac{1}{6}$ c) $\dfrac{\sqrt{3}}{6}$ d) $\dfrac{\sqrt{2}}{2}$ e) 0

Question: 6

If $\underset{\sim}{a} = 2\underset{\sim}{i} + \underset{\sim}{j} + 3\underset{\sim}{k}$, $\underset{\sim}{b} = 3\underset{\sim}{i} + 2\underset{\sim}{j} + 5\underset{\sim}{k}$ and $\underset{\sim}{c} = \underset{\sim}{i} + 4\underset{\sim}{j} + n\underset{\sim}{k}$ are linearly dependent then:

a) $n = 0$ b) $n = 5$ c) $n \neq 5$ d) $n = -5$ e) $n = 5$ or $n = -5$

Question: 7

Which one of the following is NOT a unit vector?

a) $\dfrac{1}{3}\left(\underset{\sim}{i} + \underset{\sim}{j} + \underset{\sim}{k}\right)$ b) $\dfrac{1}{3}\left(2\underset{\sim}{i} + \underset{\sim}{j} + 2\underset{\sim}{k}\right)$

c) $\dfrac{1}{13}\left(12\underset{\sim}{i} + 4\underset{\sim}{j} + 3\underset{\sim}{k}\right)$ d) $\dfrac{1}{6}\left(4\underset{\sim}{i} + 2\underset{\sim}{j} + 4\underset{\sim}{k}\right)$

e) $\dfrac{1}{5}\left(3\underset{\sim}{i} + 4\underset{\sim}{k}\right)$

Question: 8

If $|\underset{\sim}{a}| = 2$ and $|\underset{\sim}{b}| = 3$ and $\underset{\sim}{a} \cdot \underset{\sim}{b} = -3\sqrt{2}$ then $|\underset{\sim}{a} - \underset{\sim}{b}|^2$ is equal to:

a) 1 b) 25 c) $13 - 6\sqrt{2}$ d) $13 + 6\sqrt{2}$ e) $25 + 6\sqrt{2}$

Question: 9

If $\underset{\sim}{a} = \dfrac{1}{2}\left(\underset{\sim}{i} - \underset{\sim}{j} + \sqrt{2}\underset{\sim}{k}\right)$ and $\underset{\sim}{b} = \dfrac{1}{2}\left(\underset{\sim}{i} - \underset{\sim}{j} - \sqrt{2}\underset{\sim}{k}\right)$ then which of the following is **NOT** true?

a) $\underset{\sim}{a}$ is perpendicular to $\underset{\sim}{b}$ b) $|\underset{\sim}{a}| = |\underset{\sim}{b}| = 1$

c)   Both $\underset{\sim}{a}$ and $\underset{\sim}{b}$ make angles of 60° with the x axis.   d)   Both $\underset{\sim}{a}$ and $\underset{\sim}{b}$ make angles of 120° with the y axis.

e)   Vector $\underset{\sim}{a}$ make angles of 135° with the z axis, and vector $\underset{\sim}{b}$ make angles of 45° with the z axis,

Question: 10

A unit vector perpendicular to

a) $\dfrac{\sqrt{2}}{6}\left(-3\underset{\sim}{i} - 3\underset{\sim}{k}\right)$ b) $\dfrac{\sqrt{2}}{6}\left(-3\underset{\sim}{i} + 3\underset{\sim}{k}\right)$ c) $\dfrac{\sqrt{2}}{6}\left(3\underset{\sim}{i} - 3\underset{\sim}{k}\right)$

d) $\dfrac{1}{6}\left(4\underset{\sim}{i} + 4\underset{\sim}{j} - 2\underset{\sim}{k}\right)$ e) $\dfrac{1}{6}\left(-4\underset{\sim}{i} - 4\underset{\sim}{j} + 2\underset{\sim}{k}\right)$