



NOMBRE: _____

CÉDULA: _____

Selección Múltiple

1. Which of the following is a set of parametric equations for the line through the points $(-3, 2, 0)$ and $(4, 3, 3)$?

- (a) $x = 4 + 7t$
 $y = 3 + t$
 $z = 3 + 3t$
- (b) $x = 4 - 3t$
 $y = 3 + 2t$
 $z = 3$
- (c) $x = -3 + t$
 $y = 2 + 5t$
 $z = 3t$
- (d) $x = -3 + 4t$
 $y = 2 + 3t$
 $z = 3t$
- (e) None of these

2. Which of the following is a set of parametric equations for the line through the points $(-2, 0, 3)$ and $(4, 3, 3)$?

- (a) $x = -2 + 2t$
 $y = t$
 $z = 3 + t$
- (b) $x = -2 + 2t$
 $y = 3t$
 $z = 3$
- (c) $x = -2 + 2t$
 $y = t$
 $z = 3$
- (d) $x = -2 + 4t$
 $y = 3t$
 $z = 3 + 3t$
- (e) None of these

(1)

let $\mathbf{u} = 3\mathbf{i} - \mathbf{j} - 2\mathbf{k}$, $\mathbf{v} = -2\mathbf{i} - 3\mathbf{j} + 2\mathbf{k}$ and $\mathbf{w} = \mathbf{i} + 2\mathbf{k}$.

3. Calculate $\mathbf{u} \cdot (\mathbf{v} \times \mathbf{w})$.

- (a) -30
- (b) $-18\mathbf{i} - 6\mathbf{j} - 6\mathbf{k}$
- (c) -16
- (d) -24
- (e) None of these

4. Calculate $\text{proj}_{\mathbf{v}}\mathbf{u}$.

- (a) $-\frac{7}{17}$
- (b) $\langle \frac{14}{17}, \frac{21}{17}, -\frac{14}{17} \rangle$
- (c) $\sqrt{17}$
- (d) $\langle 14, 21, -14 \rangle$
- (e) None of these

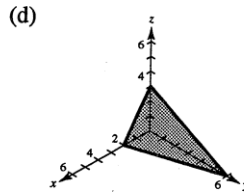
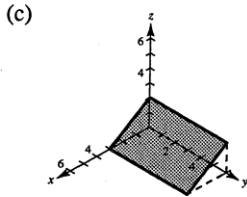
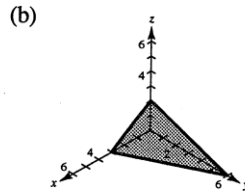
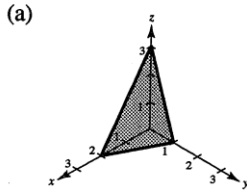
5. Calculate $\cos \theta$ where θ is the angle between \mathbf{u} and \mathbf{v} .

- (a) $\frac{-7}{2\sqrt{17}}$
- (b) $\frac{-7}{\sqrt{238}}$
- (c) $\frac{-13}{\sqrt{238}}$
- (d) $\frac{-13}{2\sqrt{17}}$
- (e) None of these

6. Write an equation of the plane that contains the line given by $\frac{x}{1} = \frac{y-1}{3} = \frac{z+1}{2}$ and is perpendicular to the line given by $\frac{x-1}{-17} = \frac{y+5}{1} = \frac{z-3}{7}$.

- (a) $17x - y - 7z - 6 = 0$
- (b) $x + 3y + 2z + 8 = 0$
- (c) $x + 3y + 2z - 1 = 0$
- (d) $17x - y - 7z + 1 = 0$
- (e) None of these

7. Which of the following is a sketch of the plane given by $2x + y + 3z = 6$?



(e) None of these

8. Find an equation of the plane that passes through the points $(2, 1, -4)$, $(-3, 1, 3)$ and $(-2, -1, 0)$.

(a) $2x - 4y + 5z + 10 = 0$

(b) $7x + 6y + 5z + 20 = 0$

(c) $7x - 4y + 5z + 10 = 0$

(d) $7x - 4y + 5z + 2 = 0$

(e) None of these

9. Find a vector with magnitude $\sqrt{10}$ in the direction of $\mathbf{v} = \langle -1, 1 \rangle$.

(a) $\langle -\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}} \rangle$

(b) $\langle -\sqrt{10}, \sqrt{10} \rangle$

(c) $\langle -\sqrt{5}, \sqrt{5} \rangle$

(d) $\langle -\sqrt{2}, \sqrt{2} \rangle$

(e) None of these

10. Determine which vector is parallel to the vector $\mathbf{v} = \langle 2, -3, -1 \rangle$.

(a) $\langle 4, 6, -2 \rangle$

(b) $\langle -\frac{2}{3}, 1, \frac{1}{3} \rangle$

(c) $\langle 1, -\frac{3}{2}, \frac{1}{2} \rangle$

(d) $\langle 6, -9, 3 \rangle$

(e) None of these

11. Find the unit vector in the direction of the vector $\mathbf{v} = 2\mathbf{i} + \mathbf{j} + 2\mathbf{k}$.

(a) $\frac{2}{\sqrt{5}}\mathbf{i} + \frac{1}{\sqrt{5}}\mathbf{j} + \frac{3}{\sqrt{5}}\mathbf{k}$

(b) $\frac{2}{9}\mathbf{i} + \frac{1}{9}\mathbf{j} + \frac{2}{9}\mathbf{k}$

(c) $\mathbf{i} + \mathbf{j} + \mathbf{k}$

(d) $\frac{2}{3}\mathbf{i} + \frac{1}{3}\mathbf{j} + \frac{2}{3}\mathbf{k}$

(e) None of these

12. Find $\mathbf{u} \cdot \mathbf{v}$ if $\|\mathbf{u}\| = 40$, $\|\mathbf{v}\| = 15$, and the angle between vectors \mathbf{u} and \mathbf{v} is $\frac{2\pi}{3}$.

(a) $-300\sqrt{3}$

(b) $\frac{900}{\pi}$

(c) 300

(d) -300

(e) None of these

(2)

13. Calculate the angle that vector $\mathbf{v} = 3\mathbf{i} - 5\mathbf{j} + \mathbf{k}$ makes with the positive y-axis.
- (a) 59.5° (b) 32.3° (c) 147.7°
 (d) 80.3° (e) None of these
14. $\mathbf{v} \cdot \mathbf{v} =$ _____
- (a) $\|\mathbf{v}\|$ (b) $\frac{\mathbf{v}}{\|\mathbf{v}\|}$ (c) $\|\mathbf{v}\|^2$
 (d) $\text{proj}_{\mathbf{u}}\mathbf{v}$ (e) None of these
15. Calculate $\mathbf{u} \times \mathbf{v}$ for $\mathbf{u} = 3\mathbf{i} + 4\mathbf{j} - \mathbf{k}$ and $\mathbf{v} = 2\mathbf{i} - \mathbf{j} + 3\mathbf{k}$.
- (a) $-11\mathbf{i} + 11\mathbf{j} + 11\mathbf{k}$ (b) $13\mathbf{i} - 7\mathbf{j} + 5\mathbf{k}$ (c) $11\mathbf{i} + 11\mathbf{j} - 11\mathbf{k}$
 (d) $11\mathbf{i} - 11\mathbf{j} - 11\mathbf{k}$ (e) None of these
16. Find the area of the parallelogram having vectors $\mathbf{v}_1 = -\mathbf{i} + 2\mathbf{j} + 2\mathbf{k}$ and $\mathbf{v}_2 = 3\mathbf{i} - 2\mathbf{j} + \mathbf{k}$ as adjacent sides.
- (a) 3 (b) 10 (c) $\sqrt{101}$
 (d) $\sqrt{69}$ (e) None of these
17. Find an equation of the plane determined by the points $(1, 2, -3)$, $(2, 3, 1)$, and $(0, -2, -1)$.
- (a) $18\mathbf{i} - 6\mathbf{j} - 3\mathbf{k} = 0$ (b) $6x - 2y - z = 0$ (c) $6x - 2y - z = 5$
 (d) $14x + 6y + 3z = 17$ (e) None of these
18. Which of the following is an orthogonal pair of vectors?
- (a) $2\mathbf{i} - \mathbf{j}, \mathbf{i} + \mathbf{k}$ (b) $\mathbf{i} - \mathbf{j} + 2\mathbf{k}, -\mathbf{i} - \mathbf{j} - \mathbf{k}$ (c) $3\mathbf{i} - 2\mathbf{k}, 2\mathbf{j} - \mathbf{k}$
 (d) $5\mathbf{i} + \mathbf{j} + \mathbf{k}, -\mathbf{i} + 2\mathbf{j} + 3\mathbf{k}$ (e) None of these
19. Which of the following is a set of parametric equations for the line through the points $(-2, 0, 3)$ and $(4, 3, 3)$?
- (a) $x = -2 + 2t$
 $y = t$
 $z = 3 + t$ (b) $x = -2 + 2t$
 $y = 3t$
 $z = 3$ (c) $x = -2 + 2t$
 $y = t$
 $z = 3$
 (d) $x = -2 + 4t$
 $y = 3t$
 $z = 3 + 3t$ (e) None of these

(3)

20. Which of the following vectors is orthogonal to both \mathbf{u} and \mathbf{w} ?
- (a) \mathbf{j} (b) $\mathbf{w} \times \mathbf{u}$ (c) \mathbf{v}
 (d) $4\mathbf{j} + \mathbf{k}$ (e) None of these
21. Which of the following statements is true about the vectors $\mathbf{u} = \frac{1}{2}\mathbf{i} + \frac{1}{3}\mathbf{j} - \frac{1}{4}\mathbf{k}$ and $\mathbf{v} = -2\mathbf{i} - \frac{4}{3}\mathbf{j} + \mathbf{k}$?
- (a) \mathbf{u} and \mathbf{v} are orthogonal. (b) \mathbf{u} and \mathbf{v} are parallel.
 (c) \mathbf{u} is a unit vector of \mathbf{v} . (d) The angle between \mathbf{u} and \mathbf{v} is $\frac{\pi}{4}$.
 (e) None of these

Which of the following is a set of parametric equations for the line through the points $(-3, 2, 0)$ and $(4, 3, 3)$?

22. Determine which vector is parallel to the vector $\mathbf{v} = \langle 2, -3, -1 \rangle$.
- (a) $\langle 4, 6, -2 \rangle$ (b) $\langle -\frac{2}{3}, 1, \frac{1}{3} \rangle$ (c) $\langle 1, -\frac{3}{2}, \frac{1}{2} \rangle$
 (d) $\langle 6, -9, 3 \rangle$ (e) None of these

23. Find the unit vector in the direction of the vector $\mathbf{v} = 2\mathbf{i} + \mathbf{j} + 2\mathbf{k}$.

- (a) $\frac{2}{\sqrt{5}}\mathbf{i} + \frac{1}{\sqrt{5}}\mathbf{j} + \frac{2}{\sqrt{5}}\mathbf{k}$ (b) $\frac{2}{9}\mathbf{i} + \frac{1}{9}\mathbf{j} + \frac{2}{9}\mathbf{k}$ (c) $\mathbf{i} + \mathbf{j} + \mathbf{k}$
 (d) $\frac{2}{3}\mathbf{i} + \frac{1}{3}\mathbf{j} + \frac{2}{3}\mathbf{k}$ (e) None of these

24. Find the point of intersection of the line given by the parametric equations $x = 3 + 2t$, $y = 7 + 8t$, and $z = -2 + t$ with the yz -plane.

- (a) $(0, -5, -\frac{7}{2})$ (b) $(0, \frac{37}{3}, -\frac{4}{3})$ (c) $(3, 7, -2)$
 (d) $(-7, -33, -7)$ (e) None of these

(4)