Universidade Federal de Viçosa
Centro de Ciências Exatas
Departamento de Matemática

Gabarito $4^{\underline{a}}$ Lista - MAT 135 - Geometria Analítica e Álgebra Linear

1. (*a*) $P = (3, -1, 4)$ e $v = (1, 1, 1)$; (*b*) $P = (2, 0, 5)$ e $v = (-3, 2, -1)$;
   (*c*) $P = (3, 1, -5)$ e $v = (2, -4, 1)$; (*d*) $P = (2, , -2, 1)$ e $v = \left(-8, \frac{5}{2}, 2\right)$.

2. $r : \begin{cases} x = 2 + t \\ y = 2 + 3t \\ z = 5 \end{cases}, t \in I\!R.$

3. $m = -5$ e $n = 2$.

4. $r : \begin{cases} x = -1 + t \\ y = 2 \\ z = 3 - 5t \end{cases}, t \in I\!R.$

5. $r : \begin{cases} x = 0 + t \\ y = 0 - 2t \\ z = -6 - 5t \end{cases}, t \in I\!R$ e $r : x = -\frac{y}{2} = \frac{-z-6}{5}$

6. $P_1 = (-3, 1, 2)$.

7. $r_1 : \begin{cases} x = 2 + t \\ y = 1 + t \\ z = 0 + t \end{cases}, t \in I\!R$ e $r_2 : \begin{cases} x = 2 + t \\ y = 1 - t \\ z = 0 + t \end{cases}, t \in I\!R.$

8. $r : \begin{cases} x = 2 - 2t \\ y = -1 + 2t \\ z = 4 - 2t \end{cases}, t \in I\!R.$

9. $\begin{cases} x = -1 \\ y = 4 - 4t \\ z = 5 - 2t \end{cases}, t \in I\!R.$

10. $s : x - 1 = -\dfrac{y-3}{1} = \dfrac{z-1}{2}$

11. $m = -5$.

12. r e s não são coplanares.

13. $P = (4, 3, 9)$.

14. (a) $\pi : 2x - 3y + z - 7 = 0$; (b) $\pi : -x + y - 1 = 0$; (c) $\pi : 12x + 2y - 9z + 22 = 0$;
(d) $\pi : 4x - 2y + 5z - 6 = 0$; (e) $\pi : 2x - 2y + z - 7 = 0$; (f) $\pi : 3x + 7y + z - 19 = 0$;
(g) $\pi : y - 1 = 0$; (h) $\pi : 2x - 16y - 13z + 31 = 0$; (i) $\pi : y - z - 2 = 0$;
(j) $\pi : 4x + 4y + 3z = 0$; (k) $\pi : 3x - 2y - 2z - 1 = 0$.

15. (a) $r : (-1, 0, -2) + t(-1, 1, 1)$; (b) $r : \dfrac{2x-1}{2} = \dfrac{2y+3}{2} = -\dfrac{z}{2}$;
(c) $\dfrac{x + \frac{2}{7}}{3} = -\dfrac{y + \frac{29}{7}}{2} = \dfrac{z}{7}$; (d) $r : \dfrac{x}{2} = y + 4 = \dfrac{z-7}{4}$.

16. $\pi : 2x + 3y - z - 4 = 0$.

17. (a) $r : \begin{cases} x = 5 + 2t \\ y = 2 + t \\ z = 3 + t \end{cases}, t \in \mathbb{R}$; (b) $(1, 0, 1)$; (c) $P' = (-3, -2, -1)$; (d) $2\sqrt{6}$.

18. $\alpha : x + 2y - 4z + 3 = 0$.

19. $\begin{cases} x = -1 + 2t \\ y = 0 - 3t \\ z = 0 + 7t \end{cases}, t \in \mathbb{R}$.

20. $\pi : 2x - 8y + 3z = 0$.

21. $\pi : 4x + 23y - 9z - 49 = 0$.

22. $\pi : 2x + 3y + 4z - 31 = 0$.

23. $\pi : 3x + 2y + 5z + 6 = 0$.

24. $\pi : x + y + z + 1 = 0$.

25. $b = 0$.

26. (a) $a = 3$, $c = 8$, $d = -42$ ou $d = 40$.

    (b) $a = 0$, $c = -8$ e $d = 0$.

27. (a) Planos concorrentes e $\pi_1 \cap \pi_2 = s : \dfrac{7x - 34}{8} = -\dfrac{7y - 10}{3} = z$.

    (b) $dist(A, B) = \dfrac{60}{7}$.

28. $dist(P, \pi) = \dfrac{4\sqrt{3}}{3}$.

29. $dist(P, r) = \dfrac{\sqrt{91}}{7}$.

30. (a) $dist(P, Q) = \sqrt{3t^2 + 8}$; (b) $X_0 = (1, 2, 3)$; (c) $\overrightarrow{X_0Q} \bullet v = 0$.

31. $P = \left(\dfrac{ad}{a^2 + b^2 + c^2}, \dfrac{bd}{a^2 + b^2 + c^2}, \dfrac{cd}{a^2 + b^2 + c^2} \right)$.

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