(1) Determine a set of parametric equations of the line that contains the point \( M_0(3, 5) \) and is parallel to the vector \( \mathbf{a} = \left( \begin{array}{c} 2 \\ 1 \end{array} \right) \).

\[ \text{Ans: } x = 3 + 2t, \ y = 5 + t \]

(2) Determine the equation of the line \( L \) that contains the point \( M_0(1, -3) \) and is parallel to the line that contains the points \( A(5, 1) \) and \( B(-2, 4) \).

\[ \text{Ans: } 3x + 7y + 18 = 0 \]

(3) Determine an equation of the line that contains the point \( M_0(5, 2) \) and is perpendicular to the vector \( \mathbf{n} = \left( \begin{array}{c} -2 \\ 3 \end{array} \right) \).

\[ \text{Ans: } -2x + 3y + 4 = 0 \]

(4) Find an equation of the line \( L \) passing through the point \( M_0(1, 2) \) and perpendicular to the line \( 2x - y - 3 = 0 \).

\[ \text{Ans: } x + 2y - 5 = 0 \]

(5) Find an equation of the line that contains the points \( A(7, 3) \) and \( B(5, 8) \) and determine also its parametric equations.

\[ \text{Ans: } 5x + 2y - 41 = 0; \ x = 5 + 2t, \ y = 8 - 5t \]

(6) Determine an equation of the line that passes through \( M_0(-2, 4) \) and whose angle of inclination is \( \frac{\pi}{3} \).

\[ \text{Ans: } y = \sqrt{3}x + 4 + 2\sqrt{3} \]

(7) Find the intercept form of the equation of the line passing through the points \( A(-2, -2) \) and \( B(1, -8) \).

\[ \text{Ans: } \frac{x}{3} + \frac{y}{6} = 1 \]

(8) Find the equation of a line \( L \) through the origin and perpendicular to the line \( 3x + 4y + 6 = 0 \).

\[ \text{Ans: } 4x - 3y = 0 \]

(9) Find the acute angle formed by the two intersecting lines \( 4x - 2y - 1 = 0 \) and \( 3x + y - 1 = 0 \).

\[ \text{Ans: } \frac{\pi}{4} \]

(10) Find the normal form of the equation of the line \( 7x - 24y + 50 = 0 \) and find the distance from the origin to the line.

\[ \text{Ans: } -\frac{7}{25}x + \frac{24}{25}y - 2 = 0; \ 2 \]

(11) Find the deviation, and hence the distance, of the point \( M_1(2, 1) \) from the line \( 3x + 4y - 5 = 0 \).

\[ \text{Ans: } 1; \ 1 \]
(12) Find an equation of the plane passing through the points \(A(1, 2, 1), B(0, -2, 3)\) and 
\(C(-1, 2, -1)\). \hspace{1cm} \text{Ans: } 4x - 3y - 4z + 6 = 0

(13) Find an equation of the plane that contains the point \(M_0(2, -4, 3)\) and is parallel to the 
plane determined by the vectors \(\mathbf{a} = \begin{pmatrix} 1 \\ 4 \\ 2 \end{pmatrix}\) and \(\mathbf{b} = \begin{pmatrix} 3 \\ -1 \\ 5 \end{pmatrix}\). \hspace{1cm} \text{Ans: } 22x + y - 13z - 1 = 0

(14) Find the general form of the equation of the plane \(\pi\) passing through \(M_0(2, 2, 1)\) and 
perpendicular to the vector \(\overrightarrow{OM_0}\). \hspace{1cm} \text{Ans: } 2x + 2y + z - 9 = 0

(15) Determine a unit vector perpendicular to the plane \(3x + 6y - 2z + 10 = 0\). \hspace{1cm} \text{Ans: } \frac{3}{7} \mathbf{e}_1 + \frac{6}{7} \mathbf{e}_2 - \frac{2}{7} \mathbf{e}_3

(16) Determine, if possible, the intercept form of the equation of the plane 
\(3x + 4y + 6z - 12 = 0\). Sketch the plane. \hspace{1cm} \text{Ans: } \frac{x}{4} + \frac{y}{3} + \frac{z}{2} = 1

(17) Find the equation of the plane \(\pi\) which passes through the point \(M_0(6, 3, 4)\) and is parallel 
to the plane \(2x + y - 2z + 8 = 0\). \hspace{1cm} \text{Ans: } 2x + y - 2z - 7 = 0

(18) Show that the planes \(x - 3y + 2z + 6 = 0\) and \(2x - 6y + 3z - 11 = 0\) are not parallel.

(19) Show that the planes \(3x + 4y - 2z + 10 = 0\) and \(2x + y + 5z - 13 = 0\) are perpendicular.

(20) Find the two angles that are formed when the planes \(3x - 2y + 6z + 5 = 0\) and 
\(3x + 5y - 8z + 3 = 0\) intersect. \hspace{1cm} \text{Ans: } \frac{3\pi}{4}, \frac{\pi}{4}

(21) Find the distance of the point \(M(1, 3, -2)\) from the plane \(2x + 2y - z + 3 = 0\). \hspace{1cm} \text{Ans: } \frac{13}{3}

(22) Determine the members of the family of parallel planes \(3x - 12y + 4z + d = 0\) such that 
the distance of \(M(1, 3, 2)\) from the planes is 2. \hspace{1cm} \text{Ans: } d = -1, 51

(23) Show that the two planes \(2x - y - z + 2 = 0\) and \(6x - 3y - 3z + 10 = 0\) are parallel and 
find the distance between them. \hspace{1cm} \text{Ans: } \frac{4}{3\sqrt{6}}

(24) Determine a set of parametric equations of the line that contains the point \(M_0(4, -1, 6)\) and 
is parallel to the vector \(\mathbf{d}\), where \(\mathbf{d} = \begin{pmatrix} 1 \\ 5 \\ 3 \end{pmatrix}\). \hspace{1cm} \text{Ans: } x = 4 + t, y = -1 + 5t, z = 6 + 3t

(25) Determine the equation of the line \(L\) passing through the points \(A(4, 3, 4)\) and \(B(-2, 5, 1)\). \hspace{1cm} \text{Ans: } \frac{x-4}{-6} = \frac{y-3}{2} = \frac{z-4}{-3}
(26) Find the equation of the line defined by the two planes $2x + y - z + 1 = 0$ and $3x - y - z - 6 = 0.$ 

\[ \text{Ans:} \quad \frac{x-1}{2} = \frac{y+3}{1} = \frac{z}{5} \]