Math 143 Set 14

1. Find the equation for the planes described below:

  a. The plane passing through $(1, -1, 1)$ and perpendicular to the vector $\langle 1, 2, 3 \rangle$.

  b. The plane passing through the origin in $\mathbb{R}^3$ and parallel to the plane $2x - y + z = 3$.

  c. The plane that contains the line
$$\begin{cases} x = 3 + 2t, \\ y = t, \\ z = 8 - t, \end{cases}$$
  for $t \in \mathbb{R}$ and is parallel to $2x + 4y + 8z = 17$.

  d. The plane which passes through the points $(1, 2, 3)$, $(4, 5, 6)$, and $(7, 8, 10)$.

  e. The plane which passes through the point $(1, 2, 3)$ and contains the line

$$\begin{cases} x = 3t, \\ y = 1 + t, \\ z = 2 - t, \end{cases}$$

  for $t \in \mathbb{R}$.

  f. The plane containing all points equidistant from the points $(1, 0, -2)$ and $(3, 4, 0)$.

  g. The plane containing $(2, 0, -1)$ and perpendicular to the line $\begin{cases} x = 4 - t \\ y = -1 \\ z = 2 + 2t \end{cases}$.