1. (a) The **parallelogram law** states that the sum of two vectors is a single vector, called their **resultant**, given by the directed diagonal of a parallelogram if the two sides directed away from the tail of this diagonal are equal to these two vectors. (b) The **triangle rule** states that when two vectors are drawn to scale and in tip-to-tail fashion, the vector connecting, and directed from, the tail of the first vector to the tip of the second vector gives the resultant of these two vectors. (c) The **position vector** of a point $P$ is the vector drawn from the origin $O$ of the coordinate system to the point $P$.  

2. $A(3, 0, 6)\text{ m},\ B(1.5, 0, -2)\text{ m},\ C(-3, 0, 2)\text{ m},\ D(0, 6, 0)\text{ m}$

   \[
   \overrightarrow{DA} = 3\mathbf{i} - 6\mathbf{j} + 6\mathbf{k},\quad \overrightarrow{DA} = 9,\quad \lambda_{DA} = \frac{1}{3}(\mathbf{i} - 2\mathbf{j} + 2\mathbf{k})
   \]

   \[
   \overrightarrow{DB} = 1.5\mathbf{i} - 6\mathbf{j} - 2\mathbf{k},\quad \overrightarrow{DB} = 6.5,\quad \lambda_{DB} = \frac{1}{13}(3\mathbf{i} - 12\mathbf{j} - 4\mathbf{k})
   \]

   \[
   \overrightarrow{DC} = -3\mathbf{i} - 6\mathbf{j} + 2\mathbf{k},\quad \overrightarrow{DC} = 7,\quad \lambda_{DC} = \frac{1}{7}(-3\mathbf{i} - 6\mathbf{j} + 2\mathbf{k})
   \]

   \[
   \mathbf{F}_{DA} = \frac{\mathbf{F}_{DA}}{3}(\mathbf{i} - 2\mathbf{j} + 2\mathbf{k}) \quad \mathbf{F}_{DB} = \frac{\mathbf{F}_{DB}}{13}(3\mathbf{i} - 12\mathbf{j} - 4\mathbf{k}) \quad \mathbf{F}_{DC} = \frac{\mathbf{F}_{DC}}{7}(-3\mathbf{i} - 6\mathbf{j} + 2\mathbf{k})
   \]

Since $\mathbf{F}_{DA} + \mathbf{F}_{DB} + \mathbf{F}_{DC} = -336\mathbf{j}$,  

\[
\mathbf{i} : \quad \frac{1}{3} F_{DA} + \frac{3}{13} F_{DB} - \frac{3}{7} F_{DC} = 0 \quad \mid \quad -\frac{6}{13} F_{DB} - \frac{12}{7} F_{DC} = -336
\]

\[
\mathbf{j} : \quad -\frac{2}{3} F_{DA} - \frac{12}{13} F_{DB} - \frac{6}{7} F_{DC} = -336 \quad \mid \quad -\frac{16}{13} F_{DB} - \frac{4}{7} F_{DC} = -336
\]

\[
\mathbf{k} : \quad \frac{2}{3} F_{DA} - \frac{4}{13} F_{DB} + \frac{2}{7} F_{DC} = 0 \quad \mid \quad \frac{42}{13} F_{DB} = 672
\]

Thus, we obtain

$F_{DA} = 36$ N $\quad F_{DB} = 208$ N $\quad F_{DC} = 140$ N