

Step-1

Consider the first plane,

$$u + 2v - w = 6.$$

Step-2

(a)

Let a be the real number.

The plane parallel to the plane $u + 2v - w = 6$ and it has of the form $u + 2v - w = a$.

Find the equation for the parallel plane passing through the origin.

Then, the given plane becomes.

$$\begin{aligned} 0 + 2(0) - (0) &= a \\ a &= 0 \end{aligned}$$

Substitute 0 for a in the plane $u + 2v - w = a$.

$$u + 2v - w = 0$$

Hence, the equation for the parallel plane passing through the origin is $\boxed{u + 2v - w = 0}$.

Step-3

(b)

Find the equation for a second plane that also contains the points $(6, 0, 0)$ and $(2, 2, 0)$.

So, the required second plane is $\boxed{u + 2v + w = 6}$.

Step-4

(c)

Find the equation for a third plane that meets the first and second in the point $(4, 1, 0)$.

The first and second plane are $u + 2v - w = 6$ and $u + 2v + w = 6$.

Let the third plane be $au + bv + cw = d$.

Here, the point $(4, 1, 0)$ is lying on the plane $au + bv + cw = d$.

$$a(4) + b(1) + c(0) = d$$

For any values of a , b , c , and d satisfy are correct.

Assume that $a = 1, b = 2, c = 3$, and $d = 6$.

Then, the plane parallel to planes $u + 2v - w = 6$ and $u + 2v + w = 6$.

The point $(4, 1, 0)$ satisfies these two planes, so the parallel plane intersects at $(4, 1, 0)$ is given by $u + 2v + 3w = 6$.

Therefore, the third plane is $u + 2v + 3w = 6$.