QUESTION
Determine the vector equation of the plane which passes through the point $P(-1, 1, 2)$ and has normal $\mathbf{i} - 2\mathbf{j} + 3\mathbf{k}$

ANSWER
The equation of the plane is $\mathbf{r}.\mathbf{n} = c$, i.e. $\mathbf{r}.(1, -2, 3) = c$. $P$ is on the plane therefore $(-1, 1, 2).(1, -2, 3) = -1 - 2 + 6 = 3 = c$ so the equation of the plane is $\mathbf{r}.(1, -2, 3) = 3$.