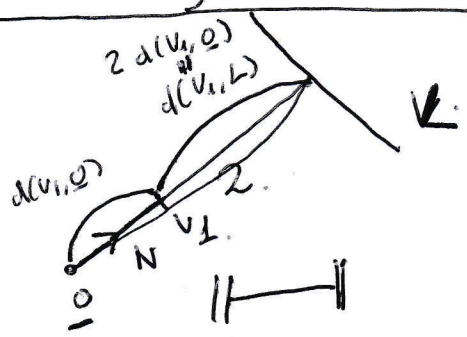
they lie on the line spanned by N, and one uses that $d(X, \underline{0}) = \frac{1}{2} d(X, L)$ and that

$$d(\underline{0}, L) = 2.$$

For example, $d(V_1, \underline{0}) = \frac{1}{2} d(V_1, L)$

$$d(V_1, \underline{0}) + d(V_1, L) = d(\underline{0}, L) = 2.$$

Therefore $d(V_1, \underline{0}) = 2/3$ and $V_1 = 2/3\, N$



3| (a) $\underline{a}(t) = (x''(t), y''(t))$. Therefore the condition is:

$$(x''(t), y''(t)) = -9\,(x(t), y(t)), \text{ that is}$$

$$\begin{cases} x''(t) = -9\, x(t). \\ y''(t) = -9\, y(t). \end{cases}$$

It follows that both $x(t)$ and $y(t)$ are solutions of the differential equation $f'' = -9f$

Hence $x(t) = a \cos 3t + b \sin 3t$ for $a, b, c, d \in \mathbb{R}$.
$y(t) = c \cos 3t + d \sin 3t$

We know that

$\underline{r}(0) = (a, c) = (5, 0)$

and $\underline{v}(0) = \underline{r}'(0) = (3b, 3d) = (0, 6)$.

Therefore $a = 5 \quad c = 0$

$b = 0 \quad d = 2.$