7. What are the equations of the line tangent to the curve parameterized by $\vec{r}(t) = 3t\,\vec{i} + 2t^2\,\vec{j} + t^5\,\vec{k}$ at $t = -1$?

position at time $t=-1$ is $(-3, 2, -1)$

$\vec{r}\,'(t) = 3\vec{i} + 4t + 5t^4\vec{k}$

$\vec{r}\,'(-1) = 3\vec{i} - 4\vec{j} + 5\vec{k}$

tan line is

$$\frac{x+3}{3} = \frac{y-2}{-4} = \frac{z+1}{5}$$

8. Find the equations of **any** line which is contained on the plane $x + 3y + 3z = 6$.

$P = (6,0,0)$ is on the plane

$Q = (0,2,0)$ is on the plane

so the line connecting P and Q is on the plane

This line is $\overline{PQ} = -6\vec{i} + 2\vec{j}$

$$\frac{x-6}{-6} = \frac{y-0}{2},\ z = 0$$