

(9)

R_t consists of rotations about the line through y in the direction of v .

When $V=0$ $R_t(x-y)=x-y$ so $p_t(x)=x+x-y+tv=x+tv$ and p_t consists of translations from x in the direction of v . ✓

If both x and v are non zero $p_t(x)=y+R_t(x-y)+tv$. Any point on the line through y in the direction of n has the form $x=y+cn$

$$p_t(y+cn)=y+R_t(y+cn)+tv$$
$$=y+R_t(cn)+tv=y+cn+tv$$

v is a multiple of n , say $v=kn$
 $\therefore p_t(y+cn)=y+cn+tkn=y+(c+tk)n \neq y+cn$
the line as a whole is preserved, but points on the line are moving in the direction of n (or v).
no helical motion - sorry

For any point not on the line, simultaneously that the vector joining the point perpendicularly to the line is being rotated around the line, that point of perpendicular contact is moving in the direction of n . ie points not on the line describe a circular helix.
+ 2 for this 5

ii) To find the generator of R_t we have to find the matrix