lines

Determine if l_1 & l_2 are // or intersecting

l_1: $r(t) = \langle 2,5,-1\rangle + t\langle 5,-2,3\rangle$ $\vec{v}_1$

l_2: $d(t) = \langle 0,-1,2\rangle + t\langle 2,5,-1\rangle$ $\vec{v}_2$

l_1	l_2
$x = 5t+2$	$x = 2q$
$y = -2t+5$	$y = 5q-1$
$z = 3t-1$	$z = -q+2$

$\vec{v}_1 \neq k\vec{v}_2$

$\nparallel$ nor overlapping

$$\left.\begin{aligned} 5t+2 &= 2q \\ -2t+5 &= 5q-1 \end{aligned}\right\} \quad q = \tfrac{5}{2}t+1 = -\tfrac{2}{5}t+\tfrac{6}{5}$$

$\frac{29}{10}t = \frac{1}{5}$ $\quad t = \frac{2}{29}$

$q = \frac{5}{2}\left(\frac{2}{29}\right)+1 = \frac{34}{29}$

$z_1 = 3\left(\frac{2}{29}\right)-1$ $\quad z_2 = -\frac{34}{29}+2$

$= \frac{-23}{29}$ $\quad = \frac{24}{29}$

l_1: $r(t) = \langle 2,1,0\rangle + t\langle 6,1,2\rangle$

l_2: $d(t) = \langle 0,-1,1\rangle + t\langle 3,2,k\rangle$

if l_1 & l_2 intersect at a pt, find k.

(l_1) $6t+2 = x = 3p$ (l_2)

$t+1 = y = 2p-1$

$t = 2p-2$

$12p - 12 + 2 = 3p$

$9p = 10$

$p = \frac{10}{9}$

$t = \frac{2}{9}$

$2t = kp + 1$

$\frac{4}{9} = k\left(\frac{10}{9}\right) + 1$

$-\frac{1}{2} = k$

$\measuredangle$ b/w l_1 & l_2

$\langle 6, 1, 2 \rangle \cdot \langle 3, 2, -\frac{1}{2} \rangle$

$= 18 + 2 - 1 = 19 = \sqrt{41}\sqrt{13.25}\cos\theta$

$\theta = 35^\circ$ or 145°