

Exit Slip #1
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$$1. \frac{x-1}{2} = \frac{y-2}{3} = \frac{z+1}{p}$$

$$x = 1 + 2t$$

$$y = 2 + 3t$$

$$z = -1 + pt$$

$$(3, 5, 2)$$

$$3 = 1 + 2t \rightarrow t = 1$$

$$z = -1 + p$$

$$\boxed{3 = p}$$

$$2a. x = 3 + 4t$$

$$y = -4 + 9t$$

$$z = 7 - 5t$$

$$2b. \frac{x-3}{4} = \frac{y+4}{9} = \frac{z-7}{-5}$$

$$2c. \vec{r} = \begin{pmatrix} 3 \\ -4 \\ 7 \end{pmatrix} + \lambda \begin{pmatrix} 4 \\ 9 \\ -5 \end{pmatrix}$$

$$3. \begin{array}{l} L_1 \\ d_1 = 1 + 5j - 3k \\ L_2 \\ d_2 = -5i + 3j + k \end{array}$$

$$\cos \theta = \frac{d_1 \cdot d_2}{|d_1| |d_2|}$$

$$\cos \theta = \frac{(1)(-5) + (5)(3) + (-3)(1)}{\sqrt{1+25+9} \cdot \sqrt{25+9+1}}$$

$$\cos \theta = \frac{7}{35}$$

$$\theta = \arccos\left(\frac{7}{35}\right)$$

$$= \boxed{78.1^\circ} \quad 78.5^\circ$$

$$4. \begin{array}{l} L_1 \\ d_1 = ki + 2j + 3k \\ L_2 \\ d_2 = (k-1)i + 3j + 4k \end{array}$$

$$d_1 \cdot d_2 = 0$$

$$(k)(k-1) + (2)(3) + (3)(4) = 0$$

$$k^2 - k - 6 = 0$$

$$(k-3)(k+2) = 0$$

$$\boxed{\begin{array}{l} k=3 \\ k=-2 \end{array}}$$

$$5. \frac{z}{5} \rightarrow -\frac{5}{2}$$

$$y = -\frac{5}{2}x + b$$

$$(1, 2)$$

$$2 = -\frac{5}{2} + b$$

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

$$y = -\frac{5}{2}x + \frac{9}{2}$$

$$d = 5i - 2j$$

$$\vec{r} = \begin{pmatrix} 1 \\ 2 \end{pmatrix} + \lambda \begin{pmatrix} 5 \\ -2 \end{pmatrix} \begin{pmatrix} 2 \\ -5 \end{pmatrix}$$

$$6a. \begin{array}{l} x = 1 + 2t \\ y = -2 + t \end{array}$$

$$6b. \begin{array}{l} (x, y) \\ d = 2i + j \end{array} \quad (2, -2)$$

$$\begin{pmatrix} x-2 \\ y+2 \end{pmatrix} \rightarrow \begin{pmatrix} 1+2t-2 \\ -2+t+2 \end{pmatrix} = \begin{pmatrix} -1+2t \\ t \end{pmatrix}$$

$$\begin{pmatrix} -1+2t \\ t \end{pmatrix} \cdot \begin{pmatrix} 2 \\ 1 \end{pmatrix} = 0$$

$$-2 + 4t + t = 0$$

$$5t = 2$$

$$\boxed{t = \frac{2}{5}}$$

