59) $\vec{AB} = (-1; -2; 2)$

$|\vec{AB}| = \sqrt{1+4+2^2} = 3 \Rightarrow \pm\frac{1}{3} |\vec{AB}|:1$

$\frac{\vec{AB}}{3} = (-\frac{1}{3}; -\frac{2}{3}; \frac{2}{3}) \Rightarrow M_1 = [1-\frac{1}{3}|4+\frac{2}{3}; 3+\frac{2}{3}]$

$-\frac{\vec{AB}}{3} = (\frac{1}{3}; \frac{2}{3}; -\frac{2}{3}) \Rightarrow M_2 [1+\frac{1}{3}; 4+\frac{2}{3}; 3+-\frac{2}{3}]$

61) $\vec{BC} = (-4; 4; -4) \sim (1; -1; 1)$

$\vec{BC} = \{[3+k; 6-k; 2+k] \mid k \in \mathbb{R}\}$

$X \in K: \rho(X, A) =$

$\sqrt{(3+k)^2 + (4-k)^2 + (1-k)^2} =$

$= \sqrt{3k^2 - 6k + 21} = \sqrt{3(k-1)^2 + 18}$

$\rho(A, \vec{BC}) = \sqrt{18}$

67) $\vec{AB} = (3; -6; -6) \sim (1; -2; -2)$

$\vec{BC} = (-2; 1; -2)$

$\vec{AB} \times \vec{BC} = (6; 6; -3) \sim (2; 2; -1)$

$A[1; 2; 3]$

$A[-1; 4; 5] \circ \rho \Rightarrow -2 + 8 - 5 + d = 0$

$\rho: -2x + 8y - 5z$

$2x + 2y - 1z - 1 = 0$

$Z[0; 0; z]$

$\rho(Z; \rho) = \frac{|-z-1|}{\sqrt{4+4+1}} = \frac{|z+1|}{3} = 5$

$|z+1| = 15$

$z = -16 \; ; \; z = 14$

$Z[0; 0; -16]$

$Z[0; 0; +14]$

75) $\alpha: \alpha \perp \sigma \wedge A \in \alpha$

$\sigma - x + y + 2z + d = 0$

$= 2 - 3 + 2 \cdot 6 + d = 0$

$\alpha: -x + y + 2z - 7 = 0$

$\alpha \cap R: -(2-\lambda) + (3+\lambda) + 2(2\lambda) - 7 = 0$

$A = [2; -3; 6]$

$P = [-1; 4; 4]$

$6\lambda - 6 = 0 \Rightarrow \lambda = 1$

$A' = [0; M; 2]$

85) $\vec{LK} = (2; -2; 1)$

$\vec{MK} = (-1; 1; 4)$

$\vec{LK} \cdot \vec{MK} = -2 - 2 + 4 = 0 \Rightarrow$

$\Rightarrow LK \perp MK$

$\vec{L} = \vec{KM} = (1; -1; -4)$

$L = (-1; 2; 2)$

$X = (0; 1; -2)$