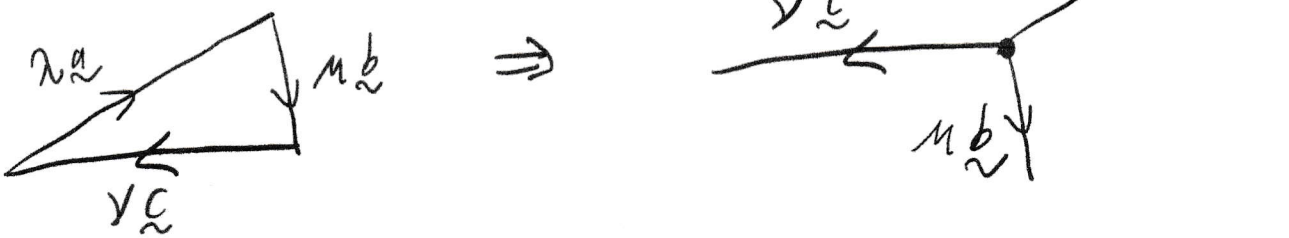
NEELU SARASWATIBHATLA (SRNS2)

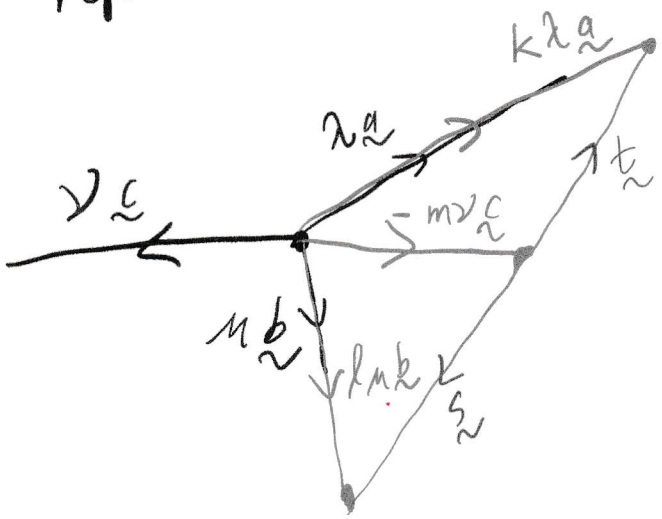
A7. $\underset{\sim}{a}, \underset{\sim}{b}$ and $\underset{\sim}{c}$ are coplanar. Let the page be the plane for ease of diagrams.

$\lambda\underset{\sim}{a} + \mu\underset{\sim}{b} + \nu\underset{\sim}{c} = \underset{\sim}{0}$ (A)

Therefore the following diagrams can be drawn:



Draw vectors in the same directions as $\underset{\sim}{a}, \underset{\sim}{b}, \underset{\sim}{c}$ to represent position vectors of collinear points:



$\underset{\sim}{s} = l\mu\underset{\sim}{b} + m\nu\underset{\sim}{c}$ (B)

$\underset{\sim}{t} = k\lambda\underset{\sim}{a} + m\nu\underset{\sim}{c}$ (C)

Since $\underset{\sim}{s}$ and $\underset{\sim}{t}$ are parallel (as these points are collinear),

$\underset{\sim}{s} = n\underset{\sim}{t}$, $n \in \mathbb{R}$ (D)

why are you supposing $\vec{s}$ and $\vec{t}$ //?

Substituting (B) and (C) into (D):

$l\mu\underset{\sim}{b} + m\nu\underset{\sim}{c} = kn\lambda\underset{\sim}{a} + mn\nu\underset{\sim}{c}$

$kn\lambda\underset{\sim}{a} - l\mu\underset{\sim}{b} = m\nu\underset{\sim}{c} - mn\nu\underset{\sim}{c}$

$kn\lambda\underset{\sim}{a} - l\mu\underset{\sim}{b} = (1-n)m\nu\underset{\sim}{c}$ (E)

(A) can be rearranged into:

$\nu\underset{\sim}{c} = -(\lambda\underset{\sim}{a} + \mu\underset{\sim}{b})$ (A')