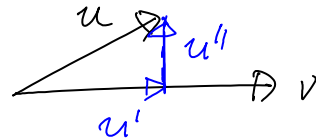


Proj. formeln ( $u$ 's proj  $u'$  på  $v$ 's riktning)

$$u' = \frac{u \cdot v}{|v|^2} \cdot v$$

a)  $u = (1, -1, 1)$ ;  $v = (1, 4, 0)$



$$u' = \frac{(1, -1, 1) \cdot (1, 4, 0)}{17} \cdot (1, 4, 0) = -\frac{3}{17} (1, 4, 0)$$

$$u'' = -u' + u = \frac{3}{17} (1, 4, 0) + (1, -1, 1)$$

$$= \frac{3}{17} (1, 4, 0) + \frac{1}{17} (17, -17, 17) =$$

$$= \frac{1}{17} (20, -5, 17)$$

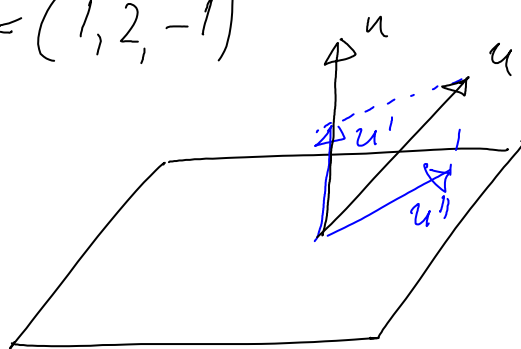
b) Linjen  $\frac{x-1}{2} = 2y = z+1$  på parameterform

$$l: \begin{cases} x = 4t + 1 \\ y = t \\ z = 2t - 1 \end{cases} \Rightarrow v = (4, 1, 2)$$

$$u^1 = \frac{(1, -1, 1) \cdot (4, 1, 2)}{21} \cdot (4, 1, 2) = \frac{5}{21} (4, 1, 2)$$

$$\begin{aligned} u^h &= -u^1 + u = -\frac{5}{21} (4, 1, 2) + (1, -1, 1) \\ &= \frac{1}{21} (1, -26, 11) \end{aligned}$$

c) Planets normal  $n = (1, 2, -1)$



$$\begin{aligned} u^1 &= \frac{u \cdot n}{|n|^2} \cdot n = \frac{(1, -1, 1) \cdot (1, 2, -1)}{6} \cdot (1, 2, -1) \\ &= -\frac{1}{3} (1, 2, -1) \end{aligned}$$

$$\begin{aligned} u^h &= -u^1 + u = \frac{1}{3} (1, 2, -1) + (1, -1, 1) \\ &= \frac{1}{3} (4, -1, 2) \end{aligned}$$