$u = (2, 3, 0) \quad v = (-3, 0, 1)$

$w = 2u - v$

$z = -3u + kv$

$w = (4, 6, 0) - (-3, 0, 1) = (7, 6, -1)$

$z = (-6, -9, 0) + k(-3, 0, 1)$

$(-6, -9, 0) + (k-3, 0, k)$

$(-6 + k(-3), -9, k) \cdot (7, 6, -2)$

$0 = 7 \cdot (-6 - 3k) + (-9 \cdot 6) - k$

$-54 = 42 - 21k - k = 0$

$-22k = 96$

$-k = \frac{96}{22} \Rightarrow -\frac{48}{11}$