3)

$$X \mapsto \frac{1}{2} \qquad Y \mapsto \frac{1}{2}Y \qquad Z \mapsto Z$$

$d = -7$ , $A = (0,0,-4)$ $\quad B = (6,0,0)$

, $A = A'$ $\quad B = B'$

a)

$C = \left(\frac{12}{5}, 0, -\frac{12}{5}\right)$

$$X' = \frac{-\frac{7}{7}}{-\frac{12}{5}} = \frac{5}{12} \qquad Y' = \frac{-\frac{7}{7}}{-\frac{12}{5}} \cdot 0 = 0 \qquad Z' = -\frac{12}{5}$$

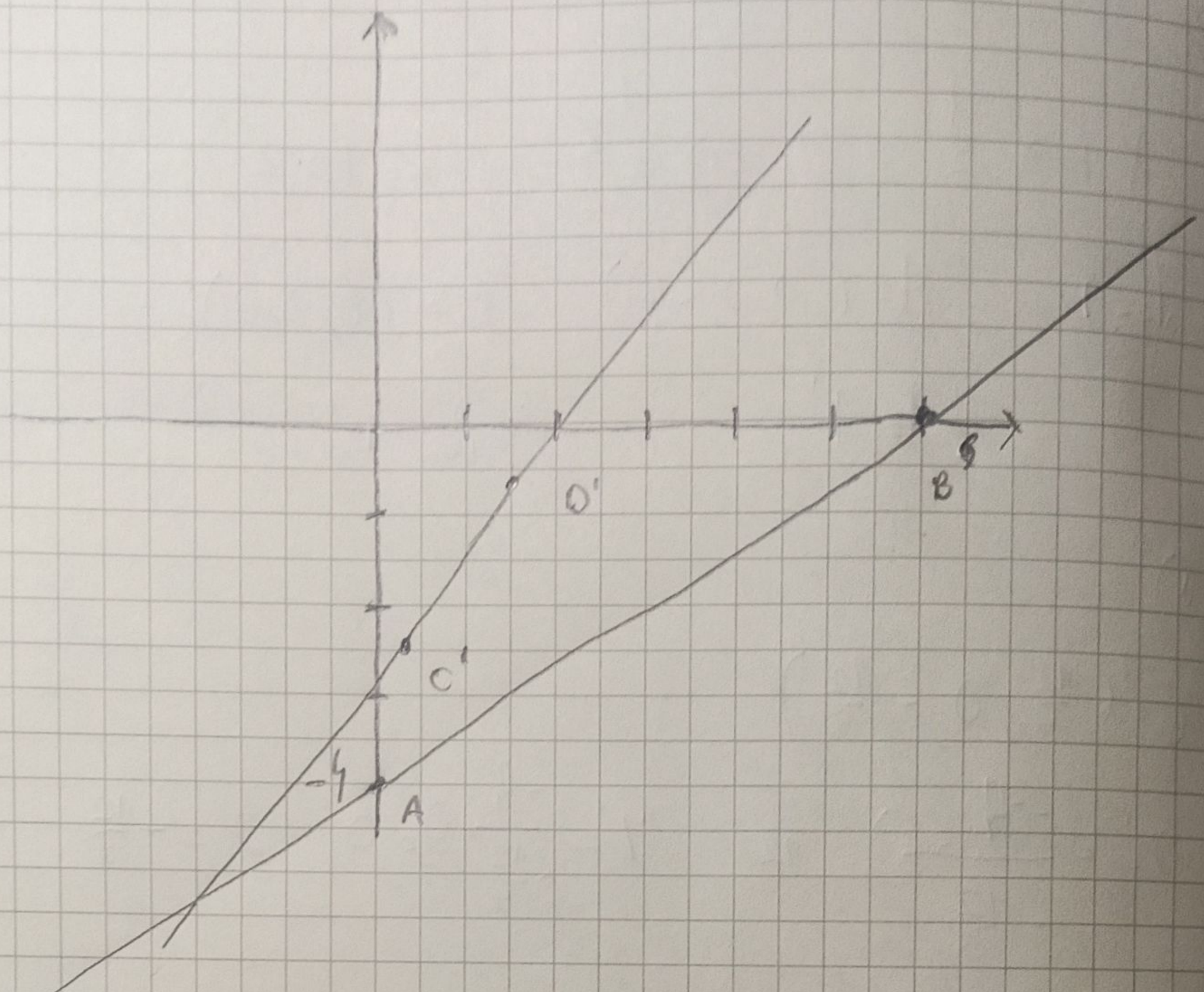
$$C' = \left(\frac{5}{12}, 0, -\frac{12}{5}\right)$$

$D = (5, 0, -\frac{2}{3})$

$$X' = \frac{-\frac{7}{7}}{-\frac{2}{3}} = \frac{3}{2} \qquad Y' = \frac{-\frac{7}{7}}{-\frac{2}{3}} \cdot 0 = 0 \qquad Z' = -\frac{2}{3}$$

$$D' = \left(\frac{3}{2}, 0, -\frac{2}{3}\right)$$

SKICA




b)

$\overrightarrow{D'C'} = D' - C' = \left(\frac{3}{2}, 0, -\frac{2}{3}\right) - \left(\frac{9}{12}, 0, -\frac{12}{5}\right) = \left(\frac{13}{12}, 0, \frac{26}{15}\right)$

$\|\overrightarrow{D'C'}\| = \sqrt{\left(\frac{13}{12}\right)^2 + \left(\frac{26}{15}\right)^2} = 2.04$

$\overrightarrow{BA} = B - A = (0,0,0) - (0,0,-4) = (0,0,4)$

$\|\overrightarrow{BA}\| = \sqrt{6^2 + 4^2} = 7.21..$

Ako su vektori paralelni kut između njih je $0°$;

$\vec{x} \cdot \vec{y} = \|\vec{x}\| \cdot \|\vec{y}\| \cdot \cos\alpha \overset{\alpha = 0°}{\Longrightarrow} \vec{x} \cdot \vec{y} = \|\vec{x}\| \cdot \|\vec{y}\|$

$\|\overrightarrow{D'C'}\| \cdot \|\overrightarrow{BA}\| = 2.04 \cdot (7.21) = 14.70$

$\overrightarrow{D'C'} \cdot \overrightarrow{BA} = \left(\frac{13}{12}, 0, \frac{26}{15}\right) \cdot (6,0,4) = \frac{13}{2} + 0 + \frac{104}{15} = 13.43$

Nyní zjistíme, že úhel $\alpha \neq 0°$, že úhel $\alpha$ je mimo rovnoběžky.

b)

$z = \alpha = -1$ $\quad A(0,0,-4)$ $\quad B = (6,0,0)$

$(x,y,z) \longmapsto (x',y',z')$

DÉLKA $AB \Rightarrow A' = A$, $B' = B$