34. Hausübung

$A=(0|0)\quad B=(21|0)\quad C=(6|8)$

Ges.: I, U, Zeichnung

$\vec{c}=\overrightarrow{AB}=\begin{pmatrix}21\\0\end{pmatrix}\parallel\begin{pmatrix}1\\0\end{pmatrix}=\vec{c}_0$

$\vec{a}=\overrightarrow{BC}=\begin{pmatrix}-15\\8\end{pmatrix}\quad |\vec{a}|=\sqrt{289}=17\quad \vec{a}_0=\begin{pmatrix}-\frac{15}{17}\\\frac{8}{17}\end{pmatrix}$

$\vec{b}=\overrightarrow{AC}=\begin{pmatrix}6\\8\end{pmatrix}\parallel\begin{pmatrix}3\\4\end{pmatrix}\quad |\vec{b}|=\sqrt{100}=10\quad \vec{b}_0=\begin{pmatrix}\frac{3}{5}\\\frac{4}{5}\end{pmatrix}$

$\vec{a}_0-\vec{c}_0=\begin{pmatrix}-\frac{15}{17}\\\frac{8}{17}\end{pmatrix}-\begin{pmatrix}\frac{17}{17}\\0\end{pmatrix}=\begin{pmatrix}-\frac{32}{17}\\\frac{8}{17}\end{pmatrix}\parallel\begin{pmatrix}-4\\1\end{pmatrix}\Rightarrow \underline{i_b: X=\begin{pmatrix}21\\0\end{pmatrix}+s\cdot\begin{pmatrix}-4\\1\end{pmatrix}}$

$\vec{b}_0+\vec{c}_0=\begin{pmatrix}\frac{3}{5}\\\frac{4}{5}\end{pmatrix}+\begin{pmatrix}\frac{5}{5}\\0\end{pmatrix}=\begin{pmatrix}\frac{8}{5}\\\frac{4}{5}\end{pmatrix}\parallel\begin{pmatrix}2\\1\end{pmatrix}\quad \Rightarrow \underline{i_a: X=\begin{pmatrix}0\\0\end{pmatrix}+t\cdot\begin{pmatrix}2\\1\end{pmatrix}}$

$i_a \cap i_b:\quad t\cdot\begin{pmatrix}2\\1\end{pmatrix}=\begin{pmatrix}21\\0\end{pmatrix}+s\cdot\begin{pmatrix}-4\\1\end{pmatrix}$

$2t=21-4s$

$t=\quad s \quad |\cdot(-2)$] +

$0=21-6s \quad |+6s$

$6s=21 \quad |:6$

$s=\frac{7}{2}\rightarrow i_b:\ X=\begin{pmatrix}21\\0\end{pmatrix}+\frac{7}{2}\begin{pmatrix}-4\\1\end{pmatrix}=\begin{pmatrix}7\\3{,}5\end{pmatrix}$

$\underline{\underline{I=(7|3{,}5)}}$

$M_c = \frac{A+B}{2} = (10{,}5 \mid 0)$ $\quad \perp \vec{AB} = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$

$M_b = \frac{A+C}{2} = (3 \mid 4)$ $\quad \perp \vec{AC} = \begin{pmatrix} 4 \\ -3 \end{pmatrix}$

$u_c: X = \begin{pmatrix} 10{,}5 \\ 0 \end{pmatrix} + s \cdot \begin{pmatrix} 0 \\ 1 \end{pmatrix}$

$u_b: X = \begin{pmatrix} 3 \\ 4 \end{pmatrix} + t \cdot \begin{pmatrix} 4 \\ -3 \end{pmatrix}$

$u_b \cap u_c: \begin{pmatrix} 3 \\ 4 \end{pmatrix} + t \begin{pmatrix} 4 \\ -3 \end{pmatrix} = \begin{pmatrix} 10{,}5 \\ 0 \end{pmatrix} + s \cdot \begin{pmatrix} 0 \\ 1 \end{pmatrix}$

$3 + 4t = 10{,}5 \rightarrow t$ ausrechnen: $\mid -3$

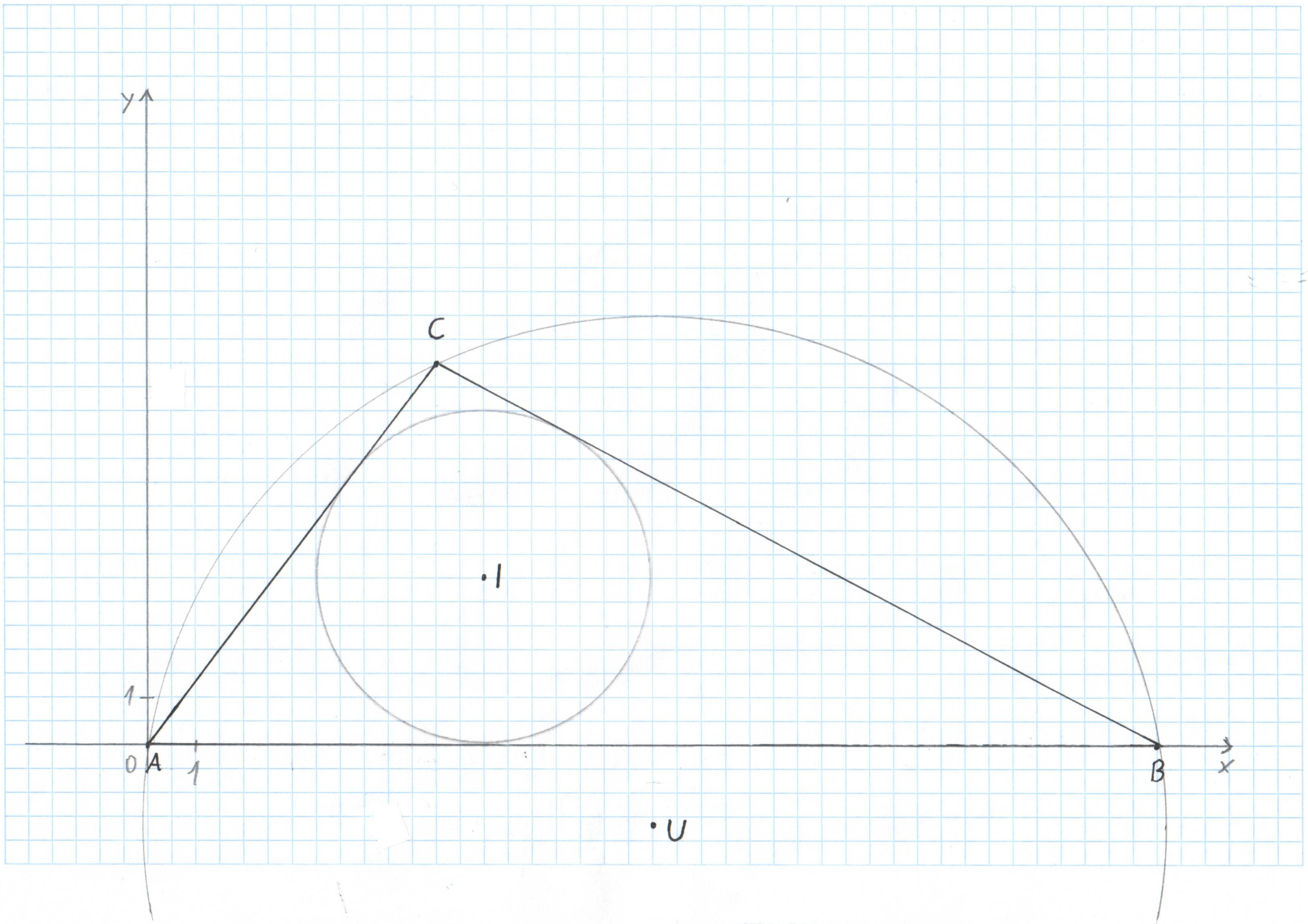
$4 - 3t = \quad s$

$4t = 7{,}5 = \frac{15}{2} \quad \mid : 4$

$t = \frac{15}{8} \rightarrow u_b$

$X = \begin{pmatrix} 3 \\ 4 \end{pmatrix} + \frac{15}{8} \cdot \begin{pmatrix} 4 \\ -3 \end{pmatrix} = \begin{pmatrix} \frac{6}{2} \\ \frac{32}{8} \end{pmatrix} + \begin{pmatrix} \frac{15}{2} \\ -\frac{45}{8} \end{pmatrix} = \begin{pmatrix} \frac{21}{2} \\ -\frac{13}{8} \end{pmatrix}$

$U = \left(\frac{21}{2} \mid -\frac{13}{8}\right) = (10{,}5 \mid -1{,}625)$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