Problem 5: The convergence of (σ_n).
[Solution]
We see that

$$
\begin{aligned}
(c_n) &= \{\alpha, \beta, \gamma, \alpha, \beta, ...\} \\
(s_n) &= \{\alpha, -\gamma,\ 0, \alpha, -\gamma, 0, ...\} \\
(\sigma_n)_{n=1}^{\infty} &= \{\frac{\alpha}{1}, \frac{\alpha-\gamma}{2}, \frac{\alpha-\gamma}{3}, \frac{2\alpha-\gamma}{4}, \frac{2\alpha-2\gamma}{5}, ...\}
\end{aligned}
$$

This means (by induction)

$$
\begin{aligned}
\sigma_{3k+1} &= \frac{(k+1)\alpha - k\gamma}{3k+1} \\
\sigma_{3k+2} &= \frac{(k+1)\alpha - (k+1)\gamma}{3k+2} \\
\sigma_{3k} &= \frac{k\alpha - k\gamma}{3k}
\end{aligned}
$$

Since the three subsequences above all converge to $\frac{\alpha-\gamma}{3}$, by zipper theorem (Problem 1), (σ_n) converges to the same limit.