10. **Another Recurrence Formula.**

The use of (5.1) and the relation (9.1) allows us to write down another recurrence formula besides (4.1).

In fact, by integrating term by term (9.1) with \(-\beta = \mu\) and applying (5.1), we find the following relation:

\[
(\mu + \alpha - \gamma \beta) \psi(\alpha + \mu, \beta, \gamma; x) - \gamma \psi(\alpha + \mu + 1, \beta, \gamma; x) + \gamma \psi(\alpha + \mu + 1, \beta, \gamma - 1; x) + \\
+ \gamma^2 \psi(\alpha + \mu, \beta, \gamma - 1; x) + x^\mu \left[ (\alpha + \gamma \beta) \psi(\alpha, \beta, \gamma; x) + \\
\gamma \psi(\alpha + 1, \beta, \gamma; x) - \gamma \psi(\alpha + 1, \beta, \gamma - 1; x) - \gamma \psi(\alpha, \beta, \gamma - 1; x) \right] = 0.
\]

**Remark 10.1**

When \(\gamma = 1\), Eq. (10.1) gives the well-known recursive relation for the incomplete \(\Gamma\)-function:

\[
(\mu + \alpha) \Gamma(\alpha + \mu, x) - \Gamma(\alpha + \mu + 1, x) + x^\mu \left[ \Gamma(\alpha + 1, x) - \\
- a \Gamma(a, x) \right] = 0,
\]

where \(a = \alpha - \beta\).