

$$\begin{aligned}
 P(X > \mu) &= 1 - P(X < \mu) = \\
 &= 1 - \int_0^{0,833} \varphi(x) \cdot dx = 1 - \int_0^{0,833} [110 \cdot (x^9 - x^{10})] \cdot dx = \\
 &= 1 - \left[ 110 \cdot \left( \frac{1}{10} \cdot x^{10} - \frac{1}{11} \cdot x^{11} \right) \Big|_0^{0,833} \right] = \\
 &= 1 - 0,43068155\dots = 0,56931844\dots \\
 &\rightarrow 0,56931844\dots \cdot 65 = 37,00\dots \approx \underline{37}
 \end{aligned}$$

**Antwort:** 37 von 65 Schülern arbeiten überdurchschnittlich viel.

$$c) \quad \sigma^2 = E(x^2) - [E(x)]^2$$

$$\begin{aligned}
 E(x^2) &= \int_0^1 x^2 \cdot \varphi(x) \cdot dx = 110 \cdot \int_0^1 (x^{11} - x^{12}) \cdot dx = \\
 &= 110 \cdot \left( \frac{1}{12} \cdot x^{12} - \frac{1}{13} \cdot x^{13} \right) \Big|_0^1 = \\
 &= \underbrace{0,70512820\dots}_{A}
 \end{aligned}$$

$$[E(x)]^2 = \underbrace{0,6944}_{B}$$

$$\sigma^2 = A - B = 0,01068376\dots$$

$$\rightarrow \sigma = 0,10336227\dots$$