

A6) • Berechnung der K 's

$$\int_0^3 K_1 x^5 dx = K_1 \frac{1}{6} x^6 \Big|_0^3 = \frac{729}{6} \cdot K_1 \stackrel{!}{=} 1 \Rightarrow K_1 = \left(\frac{729}{6}\right)^{-1} = 12.15^{-1}$$

$$\int_0^3 K_2 x^7 dx = K_2 \frac{1}{8} x^8 \Big|_0^3 = \frac{6561}{8} \cdot K_2 \stackrel{!}{=} 1 \Rightarrow K_2 = \frac{8}{6561} = 0.00122$$

[brauchen nicht!]

• $H_0: X \sim f_0$ vs $H_1: X \sim f_1$

• $\alpha = 5\%$, $n = 1$

• NP-Lemma:

$$\frac{K_2 x^7}{K_1 x^5} = \frac{K_2}{K_1} x^2 \quad \rightarrow P_0 \left[\frac{K_2}{K_1} x^2 > K \right] = \alpha \quad (1)$$

$$\rightarrow P_0 \left[x^2 > K \cdot \frac{K_1}{K_2} \right] = \alpha$$

$$\text{f. } x > 0 \rightarrow P_0 \left[x > \underbrace{\sqrt{K \cdot \frac{K_1}{K_2}}}_{K'} \right] = \alpha$$

$$P_0 [x > K'] = \alpha = 5\%$$

$$\int_{K'}^3 K_1 \cdot x^5 dx = K_1 \cdot \frac{1}{6} x^6 \Big|_{K'}^3 = \frac{K_1}{6} (729 - (K')^6) \stackrel{!}{=} 0.05 \quad (1)$$

$$(K')^6 = \left(\frac{1}{20} \cdot 6 \cdot \frac{1}{K_1} - 729 \right) \cdot (-1)$$

$$\Rightarrow K' = 2.97446$$

$x > 2.97446 \Rightarrow H_1$ ablehnen

$x < 2.97446 \Rightarrow H_0$ ablehnen (1)