

# Kapitel I

## Stichprobenverteilung

### (Lösungen)

1. 1.

1.

$$\begin{aligned} P\left(67 \leq \bar{X} < 69\right) &= F(69) - F(67) \\ &= \Phi\left(\frac{69-68}{3}\right) - \Phi\left(\frac{67-68}{3}\right) \\ &= \Phi\left(\frac{1}{3}\right) - \Phi\left(-\frac{1}{3}\right) = \Phi\left(\frac{1}{3}\right) - \left(1 - \Phi\left(\frac{1}{3}\right)\right) = 2\Phi\left(\frac{1}{3}\right) - 1 \\ &= 2 \cdot 0.6293 - 1 = 0.2586. \end{aligned}$$

2.

$$\begin{aligned} n=9, \quad \sigma_{\bar{x}} &= \frac{\sigma}{\sqrt{n}} = \frac{3}{3} = 1 \\ P\left(67 \leq \bar{X} < 69\right) &= F(69) - F(67) \\ &= \Phi\left(\frac{69-68}{1}\right) - \Phi\left(\frac{67-68}{1}\right) \\ &= \Phi(1) - \Phi(-1) \\ &= \Phi(1) - (1 - \Phi(1)) = 2 \cdot \Phi(1) - 1 \\ &= 2 \cdot 0.8413 - 1 = 0.6826. \end{aligned}$$

1. 2.

Sei

$X$  : „Laufzeit [km] der Reifensorte“

Wir haben:

$$\mu = 48000, \quad \sigma = 3600, \quad n = 64.$$

$$\begin{aligned} P(X < 47100) &= F(47100) = \Phi\left(\frac{47100 - 48000}{\frac{3600}{\sqrt{64}}}\right) \\ &= \Phi(-2) = 1 - \Phi(2) = 1 - 0.9772 = 0.0228. \end{aligned}$$

(Letzte Aktualisierung: 07.02.2015)