

Opgaver - Lektion 3

1) a) $s = 0.224$

b) $\frac{s}{\sqrt{5}} = 0.1$

$(\bar{x} = 1)$

c) $\bar{x} \pm 1.96 \cdot 0.1 = [0.804; 1.196]$

2

a) $\bar{x} = 3.068$ $s = 1.023$

b) $\hat{s}^2 = \frac{1}{16} \sum_{i=1}^{10} (x_i - 3)^2 = 0.946$

$\hat{s} = \sqrt{0.9462} = 0.973$

3

$s_y^2 = 11.67$ $\hat{\sigma} = \sqrt{\frac{s_y^2}{2}} = 2.415$

4)

a) $x^3 \approx \mu^3 + 3\mu^2(x - \mu)$ $\mu = 5$

b) $EY \approx 5^3 = 125$ $\text{Var } Y \approx (3 \cdot 5^2)^2 \cdot 0.02 = 112.5$

5)

a) $\tan(x) \approx \tan\left(\frac{2\pi}{400} \cdot 40\right) + \left(1 + \tan\left(\frac{2\pi}{400} \cdot 40\right)^2\right) \frac{\pi}{200} (x - 40)$

b) $EY \approx \tan\left(\frac{2\pi}{400} \cdot 40\right) = 0.7265$

$\text{Var } Y \approx \left[\left(1 + \tan\left(\frac{2\pi}{400} \cdot 40\right)^2\right) \frac{\pi}{200}\right]^2 \cdot 0.01 = 5.76 e^{-06}$