

Problem #7865 The average estimate for the body repair on an automobile is \$1540. From insurance records it has been determined that the population standard deviation is \$640. A. What is the probability of selecting a sample of 49 and the sample mean being above \$1600?.

Solution Denote by $\xi_i, i = \overline{1, 49}$ — the cost of automobile repair of i -th customer. We are to estimate $P\left(\frac{\xi_1 + \dots + \xi_{49}}{49} > 1600\right) = P\left(\frac{\xi_1 + \dots + \xi_{49}}{\sqrt{49} \cdot 640} > 1600\sqrt{49}/640\right) \approx 1 - \Phi(1600/4480) \approx 0.363$. The approximate equality follows from CLT.

Answer 0.363.