Problem #7904 During production in a cement plant, test cubes of cement are taken at regular intervals and their compressive strengths, in kg m-2, determined. Analysis of data over a long time has shown that the compressive strength of these samples is normally distributed with a mean 0.0468 kg m-2 and a standard deviation 1.6 ? 10-3 kgm-2. Calculate the probability that a randomly chosen sample has a compressive strength below 0.045 kg m-2.

Solution Denote by ξ the compressive strength of a randomly chosen sample. We are to calculate $P(\xi > 0.045) = P(\dfrac{\xi - 0.0468}{1.6 \cdot 10^{-3}} > \dfrac{0.045 - 0.0468}{1.6 \cdot 10^{-3}}) = 1 - \Phi(-1.125) \approx 1 - 0.13 = 0.87$.

Answer 0.87 .