

## Answer on Question #45694 – Math – Statistics and Probability

### Task:

A stamping machine produces 'can tops' whose diameters are normally distributed with a standard deviation of 0.02 inch. At what nominal mean diameter should the machine be set, so that no more than 9 % of the 'can tops' produced have diameters exceeding 3.5 inches?

### Solution:

Let  $X$  be the diameter of a can top produced by the machine, then  $X$  is assumed a normal distribution with to - be-determined mean  $\mu$  and standard deviation 0.01. From the question we need to consider  $P(X > 3.5) < 0.09$ . So we solve

$$0.09 > P(X > 3.5) = P\left(Z > \frac{3.5 - \mu}{0.02}\right).$$

From tables on the standard normal distribution, we have  $\frac{3.5 - \mu}{0.02} > 1.34$ , and therefore it should be set  $\mu < 3.473$  inch.