

Answer on Question #54885 – Math – Statistics and Probability

Most people think that the “normal” adult body temperature is 98.6 degrees. That figure based on 19th-century study, has recently been challenged. In a 1992 article in the journal of the American medical association, researchers reported that a more accurate figure may be 98.2 degree. Furthermore the standard deviation appeared to be around 0.7 degrees. Assume that a normal model is appropriate.

- a) in what interval would you expect most people’s body temps to be? Explain
- b) what fraction of people would be expected to have body temperatures above 98.6?
- c) Below what body temp are the coolest 20% of all people?

Solution

- a) 95% of values are within 2 standard deviations of the mean, so

$$98.2 \pm 2 \cdot 0.7 = 96.8 \text{ to } 99.6$$

- b)

$$z = \frac{x - \mu}{s} = \frac{98.6 - 98.2}{0.7} = 0.57.$$

Using z-table calculate

$$P(z > 0.57) = 1 - P(z < 0.57) = 1 - 0.7157 = 0.2843.$$

- c) The z value for the lowest 20% is

$$z = -0.8416 \text{ (from a table)}$$

Using the z formula calculate

$$x = \mu + z\sigma = 98.2 - 0.8416 \cdot 0.7 = 97.61.$$