Normal Distribution problems

Questions:

1. For each z-score, find the area to the left and the area to the right.
   (a) \( z = 1.00 \), (b) \( z = 2.50 \), (c) \( z = -0.46 \), (d) \( z = -2.19 \).

2. For each pair of z-scores, find the area between them and the area outside of them.
   (a) \( z_1 = -1.00, z_2 = 1.00 \), (b) \( z_1 = 2.00, z_2 = 2.50 \), (c) \( z_1 = -2.33, z_2 = 2.33 \), (d) \( z_1 = -2.19, z_2 = 2.19 \).

3. For each area, find the z-score with that area to the left.
   (a) 0.10, (b) 0.25, (c) 0.60, (d) 0.98.

4. For each area, find the number \( z \) so that the area between \(-z\) and \( z \) is the given area.
   (a) 0.50, (b) 0.80, (c) 0.95, (d) 0.99

5. If an observation is 2.37 standard deviations below the mean, its z-score is ______________.

6. Find the area between 100 and 200 under a normal curve with \( \mu = 120 \) and \( \sigma = 50 \).

7. Find the 90th percentile of the normal curve in the previous problem.

8. Body temperatures of healthy adults are normally distributed with a mean of 98.20°F and a standard deviation of 0.62°F according to a study by University of Maryland doctors.
   (a) What proportion of healthy adults have body temperatures greater than 98.6°F, the value often thought to be the mean?
   (b) What proportion of healthy adults have body temperatures between 98.00°F and 99.00°F?
   (c) Find the two temperatures that are the endpoints of the middle 99% of body temperatures of healthy adults.
   (d) Find the 10th percentile of the distribution,