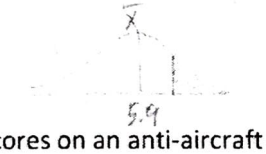
Non-Standard Normal Distribution

1. Assume that body temperatures of normal healthy persons are normally distributed with a mean of 98.2ºF and a standard deviation of 0.62ºF. If we define a fever to be a body temperature above 100ºF, what percentage of normal and healthy persons would be considered to have a fever?

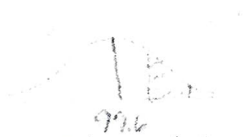
$z = \frac{100 - 98.2}{0.62} = 2.90$ $\quad 1 - 0.9981 = 0.0019 \rightarrow$ **0.19%**

2. On one measure of attractiveness, scores are normally distributed with a mean of 5.9 and a standard deviation of 0.7. What percent of the population has a measure of attractiveness greater than 7.0?



$z = \frac{7 - 5.9}{0.7} = 1.57$ $\quad 1 - 0.9418 = 0.0582 \rightarrow$ **5.82%**

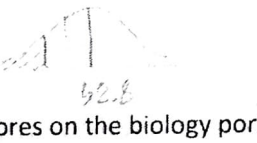
3. Scores on an anti-aircraft exam are normally distributed with a mean of 99.6 and a standard deviation of 25.8. For a randomly selected subject, find the probability that a score will fall between 110.00 and 150.00.



$z_1 = \frac{110 - 99.6}{25.8} = 0.40$ $\quad 0.9744 - 0.6554 =$ **0.319**

$z_2 = \frac{150 - 99.6}{25.8} = 1.95$

4. For a certain population, scores on the Miller Analogies Test are normally distributed with a mean of 58.8 and a standard deviation of 15.9. If subjects who score below 27.00 are to be given special training, what is the percentage of subjects who will be given the special training?



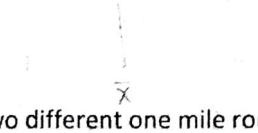
$z = \frac{27 - 58.8}{15.9} = -2$ $\quad 0.0228 \rightarrow$ **2.28%**

5. Scores on the biology portion of the Medical College Admissions Test are normally distributed with a mean of 8.0 and a standard deviation of 2.6. Among 600 individuals taking this test, how many are expected to score between 6.0 and 7.0?

$z_1 = \frac{6 - 8}{2.6} = -0.77$ $\quad 0.3520 - 0.2206 = 0.1314$

$z_2 = \frac{7 - 8}{2.6} = -0.38$ $\quad 0.1314(600) =$ **78.84**

6. The Chemco Company, which manufactures car tires, finds that the tires last distances that are normally distributed with a mean of 35,600 mi. and a standard deviation of 4275 mi. The manufacturer wants to guarantee the tires so that only 3% will be replaced because of failure before the guaranteed number of miles. For how many miles should the tires be guaranteed?



$z = -1.88$ yields 0.0301

$\frac{x - 35600}{4275} = -1.88$

$x =$ **27,563 miles**

7. Two different one mile routes were set up for 1200 P.E. students. The times to complete the downhill course are normally distributed with a mean of 420 seconds and a standard deviation is 75 seconds. What percentage of students finished the downhill course between 350 and 550 seconds?

$z_1 = \frac{350 - 420}{75} = -0.93$ $\quad 0.9582 - 0.1762 = 0.782$

$z_2 = \frac{550 - 420}{75} = 1.73$

78.2%