

Pledge:

10/5/2006
Dr. Lunsford

MATH 171 – Statistical Decision Making
Test 1

Name: Solution
100 Points Possible

Please show all work on this test. Also, if you use a built in calculator function (such as normalcdf) please indicate your inputs to the function.

Problem I. An efficiency group studied the amount of time customers waited in check out lines at Target before reaching the cashier. Below you are given the waiting times (in minutes) of 20 randomly chosen Target customers. The data are given in ascending order for your convenience. Please complete the following: (36 points total)

2, 2, 3, 3, 5, 5, 6, 6, 7, 7, 8, 9, 10, 12, 13, 17, 18, 20, 22, 25

(a) Please complete the frequency chart to the right. (6 points)

X : Waiting Time	Frequency	Percent Frequency
$0 \leq X < 5$	4	20%
$5 \leq X < 10$	8	40%
$10 \leq X < 15$	3	15%
$15 \leq X < 20$	2	10%
$20 \leq X < 25$	2	10%
$25 \leq X < 30$	1	5%

(b) Use the frequency chart of the data to construct a percent frequency histogram on the axes provided below. Although I have provided values on the axes, please clearly label your axes for this histogram. (6 points)

(c) What percent of the customers in the sample had a waiting time of at least 15 minutes? Please show this percent graphically by shading the appropriate area on your histogram. (4 points)

$$\frac{2+2+1}{20} = \frac{5}{20} = .25 \quad \boxed{25\%}$$

(d) Find the sample mean and sample standard deviation of the waiting times for these customers. Clearly indicate your answers. (4 points)

$$\bar{x} = 10 \text{ (sample mean) } \left. \begin{array}{l} \text{both in} \\ \text{minutes} \end{array} \right\}$$
$$s = 6.981 \text{ (sample std. dev.) } \left. \begin{array}{l} \text{both in} \\ \text{minutes} \end{array} \right\}$$

(e) Find the five number summary of the waiting times for these customers. Clearly indicate your answers. (5 points)

$$\min = 2, Q_1 = 5, \text{ med} = 7.5, Q_3 = 15, \max = 25 \quad \left. \begin{array}{l} \text{all in} \\ \text{minutes} \end{array} \right\}$$

(f) Circle all descriptors below which describe the distribution of the waiting times for customers at Target. (2 points)

Left Skewed

Right Skewed

Uniform

Symmetric

Unimodal

Bimodal



