Last Name: _____

First Name: _____

Student ID: _____

Quiz 1

Question 1. Listed below are observations collected in a study in which foot length (in centimetres) was measured in a sample of fourth grade children from a certain school.

22.4	23.4	22.5	23.2	23.1	23.7	24.1	21.0	21.6	20.9
25.5	22.8	24.1	25.0	24.0	21.7	22.0	22.7	24.7	23.5

(a) *(3 marks)* **Sort** the data using a stem and leaf display.
(b) *(1 marks)* Find the sample mean.
(c) *(1 marks)* Find the total variation, $SS(x)$.
(d) *(1 marks)* Find the sample standard deviation, s.
(e) *(4 marks)* What percentage of data falls within two standartd deviations from the mean. Is this consistent with the empirical rule?
(f) *(5 marks)* Find the five number summary for this data.
(g) *(2 marks)* Construct a box and whiskers diagram for this data.

Question 2. Consider the data set given below.

164	162	163	162	165	166	163	161	160	164
164	165	163	164	164	163	164	162	163	164

(a) *(5 marks)* Construct an ungrouped frequency, relative frequency, and cumulative frequency distribution for this data (you can put all of this information on the same chart).
(b) *(3 marks)* Construct a ungrouped relative frequency histogram for this data (you only need to label the y-axis).

QUIZ 1

a)

20	9
21	0 6 7
22	4 5 8 0 7
23	4 2 1 7 5
24	1 1 0 7
25	5 0

UNITS:
STEM: ONES DIGIT
LEAF: TENTHS DIGIT

SORTED

20.9 21.0 21.6 21.7 22.0 22.4 22.5 22.8 22.8 23.1
23.2 23.4 23.5 23.7 24.0 24.1 24.1 24.7 25.0 25.5

b) $\bar{x} = 23.095$

c) $SS(x) = \Sigma x^2 - \frac{(\Sigma x)^2}{n} = 10698.71 - \frac{(461.9)^2}{20}$

$= 31.1295$

d) $s^2 = \frac{SS(x)}{n-1} = \frac{31.1295}{19} = 1.6383947$

$s = \sqrt{1.6383947} = 1.28000$

e) $\bar{x} + 2s = 23.095 + 2(1.28000) = 25.655$

$\bar{x} - 2s = 23.095 - 2(1.28000) = 20.535$

100% OF THE DATA FALLS WITHIN TWO STANDARD DEVIATIONS OF THE MEAN. THIS IS NOT CONSISTANT WITH THE EMPIRICAL RULE WHICH SAYS IT SHOULD BE ABOUT 95%.

f) $\boxed{L = 20.9}$

$Q_1 = P_{25}$

$\frac{25}{100} \cdot 20 = 5 \Rightarrow d = 5.5$

$\therefore \boxed{Q_1 = \frac{22.0 + 22.4}{2} = 22.2}$

$Q_2 = P_{50}$

$\frac{50}{100} \cdot 20 = 10 \Rightarrow d = 10.5$

$\boxed{Q_2 = \frac{23.1 + 23.2}{2} = 23.15}$

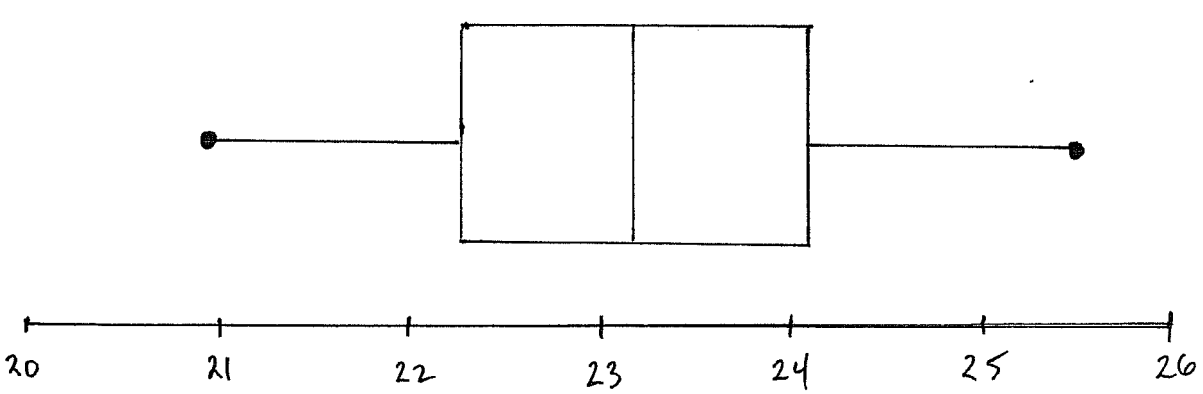
$Q_3 = P_{75}$

$\frac{75}{100}(20) = 15 \Rightarrow d = 15.5$

$\boxed{Q_3 = \frac{24.0 + 24.1}{2} = 24.05}$

$\boxed{H = 25.5}$

g)



2 a)

x	f	rf	cf
160	1	$1/20 = 0.05$	1
161	1	$1/20 = 0.05$	2
162	3	$3/20 = 0.15$	5
163	5	$5/20 = 0.25$	10
164	7	$7/20 = 0.35$	17
165	2	$2/20 = 0.1$	19
166	1	$1/20 = 0.05$	20

b)