WST 211: Practical 2 Memo

Question 1:

```
options linesize=70 nodate nocenter pageno=1;

*********************** Question 1 ********************;
data a;
p10=quantile('normal',0.1,100,15);
p25=quantile('normal',0.25,100,15);
p50=quantile('normal',0.5,100,15);
p75=quantile('normal',0.75,100,15);
p90=quantile('normal',0.9,100,15);
prob_a=1-cdf('normal',110,100,15);
prob_b=cdf('normal',110,100,15)-cdf('normal',90,100,15);
run;

proc print data=a;
title 'Dataset A';
run;
```

SAS Output:

a)

Obs	p10	p25	p50	p75	p90	prob_a	prob_b
1	80.7767	89.8827	100	110.117	119.223	0.25249	0.49501

b)

i. $P(X > 110) = 0.25249$

ii. $P(90 \leq X \leq 110) = 0.49501$

Question 2:

```
***************** Question 2 ***************;
data b;
  do i=1 to 1000;
  IQ=100+rannor(15)*15;
  if IQ<90 then IQgrp=1;
  if 90<=IQ<=110 then IQgrp=2;
  if IQ>110 then IQgrp=3;
  output;
end;
```

```
proc univariate data=b;
  var IQ;
  histogram / normal (color=(red blue) mu=100 est sigma=15 est);
title 'Dataset B';
run;

proc freq data=b;
  tables IQgrp;
run;
```

SAS Output:

i.

Parameters for Normal Distribution		
Parameter	Symbol	Estimate
Mean	Mu	99.78947
Std Dev	Sigma	15.29261

ii.

Quantiles for Normal Distribution		
	Quantile	
Percent	Observed	Estimated
1.0	63.6399	64.2135
5.0	74.5738	74.6354
10.0	80.3351	80.1912
25.0	89.1927	89.4748
50.0	99.4959	99.7895
75.0	110.7444	110.1042
90.0	119.1851	119.3877
95.0	125.4139	124.9436
99.0	133.5908	135.3654

iii.

Dataset B
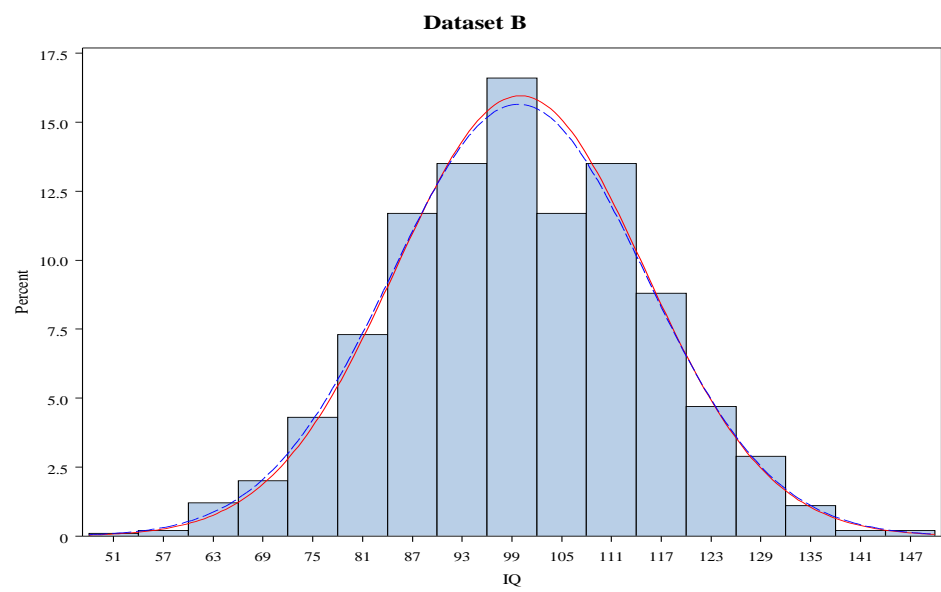
b)

IQgrp	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	268	26.80	268	26.80
2	463	46.30	731	73.10
3	269	26.90	1000	100.00

i. $P(X > 110) = 0.269$

ii. $P(90 \leq X \leq 110) = 0.463$