

Sample midterm 1 Solutions

Q1 a) A person (c/n) b) 9250 (c/n) c) obesity, smoking, lifespan, blood sugar, blood pressure, cholesterol. (n) d) categorical (c) numerical (n)

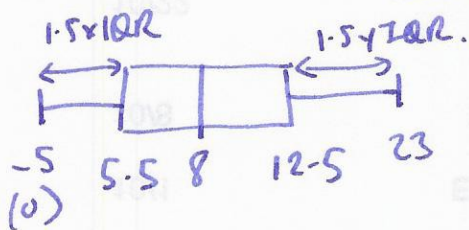
Q2 

1	2 5 6 8
2	6 9
3	2
4	7
5	
6	
7	
8	5
9	8

 b) min 120 max 980 median 275  
c) larger; skewed right.

Q3 a)  $\frac{23}{41} \times 100 \approx 56\%$  b) median ~~7.5~~ 8  $Q1 = 5.5$   
 $Q3 = 12.5$

$IQR = 12.5 - 5.5 = 7$



Q4

a) while pregnant b) never c) 75% d) true e) stop smoking, median stop smoking > median while pregnant, in fact 75% of stopped > while.

Q5

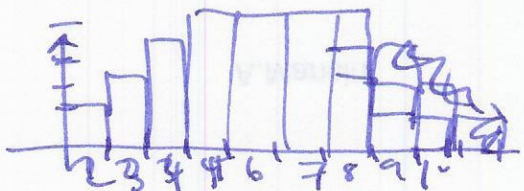
	1	2	3	4	5	6
a)	1,1	1,2	1,3	1,4	1,5	1,6
	2,1	2,2	2,3	2,4	2,5	2,6
	3,1	3,2	3,3	3,4	3,5	3,6
	4,1	4,2	4,3	4,4	4,5	4,6

sample space

b)  $P(X=3) = \frac{2}{24} = \frac{1}{12}$   
c)  $P(X < 5) = \frac{6}{24} = \frac{1}{4}$   
 $P(X \neq 8) = 1 - P(X=8) = 1 - \frac{3}{24} = \frac{7}{8}$

d)

k	2	3	4	5	6	7	8	9	10
$P(X=k)$	1	2	3	4	4	4	3	2	1



Q6 a)  $P(Z < -0.5) \approx 0.309$

b)  $P(0 < Z < 1.5) \approx 0.933 - 0.5 \approx 0.433$

in R  
quan-  
quan.

(2)

Q7 a)  $Z = \frac{X-70}{5} = \frac{3}{5} = 0.6$   $P(Z > 0.6) \approx 1 - 0.726 \approx 0.274$

b)  $\frac{75-70}{5} = 1$   $\frac{65-70}{5} = -1$   $P(-1 < Z < 1) \approx 0.683$

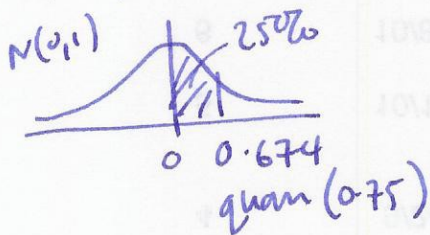
c)  $X = 5Z + 70$   $P(Z < Z_0) = 0.9 \Rightarrow Z_0 = 1.282$

$X = 5 \times 1.282 + 70 \approx 76.41$

Q8 a) 50% b) right mean > median c) 4% of 70000 = 2800

c)  $\mu = 60,087$

25% of data use  $[60,087, 69,638]$



so  $0.674\sigma = 69,638 - 60,087$

$\sigma \approx 14,170.62$