DAD 1 2016 APRIL PARTIAL 1

EXERCISE 1

x_i	f_i	$f_i \cdot x_i$	F_i	x_i^2	$f_i \cdot x_i^2$
0	15	0	15	0	0
1	25	25	40	1	25
2	60	120	100	4	240
3	45	135	145	9	405
4	40	160	185	16	640
5	15	75	200	25	375
	200				1685

POSITIONS 146-185

a) $r f_i = \frac{f_i}{n} \rightarrow r f_{x=4} = \frac{40}{200} = 0.2$

b) $\bar{X} = \frac{\Sigma f_i x_i}{n} = \frac{515}{200} = 2.575$

The most appropriate central tendency index is the arithmetic mean because the variable "number of correct answers" is quantitative.

c) $\frac{i(n+1)}{k} \rightarrow \frac{i(200+1)}{100} = 146 \rightarrow 201\,i = 14600$

$i = \frac{14600}{201} = 72.64 \simeq 73$

$\frac{i(200+1)}{100} = 185 \rightarrow 201\,i = 18500$

$i = \frac{18500}{201} = 92.04 \simeq 92$

Percentiles 73 - 92 corresponds to $X = 4$

d) $S^2 = \frac{\Sigma f_i x_i^2}{n} - \bar{X}^2 = \frac{1685}{200} - 2.575^2 = 8.425 - 6.63 = 1.795$

DAD1 2016 APRIL PARTIAL 1

EXERCISE 2

	x_i	f_i
	10	1
	18	2
Q_1	22	3
	29	4
	34	5
Q_2	37	6
	38	7
	45	8
Q_3	46	9
	52	10
	68	11
	92	12

position: $\frac{i(n+1)}{k} = \frac{1(12+1)}{4} = 3.25$

$Q_1 = X_i + D(X_{i+1} - X_i) = 22 + 0.25(29-22) = 22 + 0.25 \cdot 7 = 22 + 1.75 = 23.75$

position: $\frac{i(n+1)}{k} = \frac{2 \cdot 13}{4} = \frac{26}{4} = 6.5$

$Q_2 = 37 + 0.5 \cdot (38-37) = 37.5$

position: $\frac{3 \cdot 13}{4} = \frac{39}{4} = 9.75$

$Q_3 = 46 + 0.75(52-46) = 46 + 0.75 \cdot 6 = 46 + 4.5 = 50.5$

$Q = \frac{Q_3 - Q_1}{2} = \frac{50.5 - 23.75}{2} = \frac{26.75}{2} = 13.375$

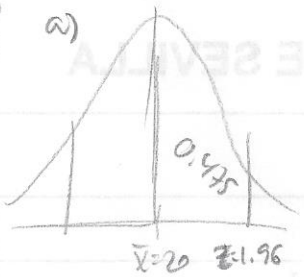
DAD1 2016 April PARTIAL 1

EXERCISE 3

$\bar{X}=20$
$S=3$

$$z = \frac{X-\bar{X}}{S}$$

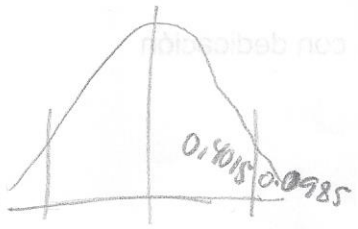
a)



$$1.96 = \frac{X-20}{3} \rightarrow 1.96 \cdot 3 = X-20$$
$$5.88 = X-20$$
$$\boxed{25.88 = X}$$

$$-1.96 = \frac{X-20}{3} \rightarrow -5.88 = X-20$$
$$20-5.88 = X$$
$$\boxed{14.12 = X}$$

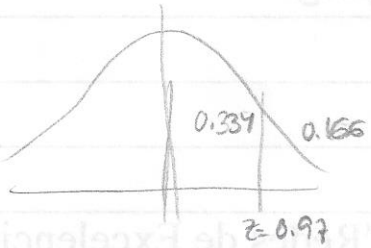
b)



$$1.29 = \frac{X-20}{3} \rightarrow 3.87 = X-20$$
$$\boxed{23.87 = X}$$

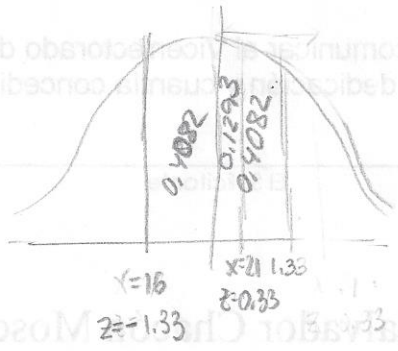
$$-1.29 = \frac{X-20}{3} \rightarrow -3.87 = X-20$$
$$\boxed{16.13 = X}$$

c)



$$0.97 = \frac{X-20}{3} \rightarrow 2.91 = X-20$$
$$\boxed{22.91 = X}$$

d)



$$z = \frac{X-\bar{X}}{S} = \frac{16-20}{3} = \frac{-4}{3} = -1.33$$

$$z = \frac{21-20}{3} = \frac{1}{3} = 0.33$$

$$0.4082 + 0.1293 = 0.5375$$

$$\boxed{53.75\,\%}$$

DADI 2016 APRIL, PARTIAL 1

EXERCISE 4

$n = 101$

$\bar{X} = 1200$

$\alpha = 0.05 \rightarrow z = 1.96$

$s = 20$

$\bar{X} \pm E = 1200 \pm 3.92 < \begin{matrix} 1203.92 \\ 1196.08 \end{matrix}$

$E = z_{\alpha/2} \cdot \sigma_{\bar{x}} = 1.96 \cdot 2 = 3.92$

$\sigma_{\bar{x}} = s/\sqrt{n-1} = 20/\sqrt{101-1} = 20/10 = 2$