(1) (a) $P(\text{LOWER OR UPPER}) = P(\text{LOWER}) + P(\text{UPPER})$

$$= \frac{364}{653} + \frac{209}{653} = \boxed{\frac{573}{653}}$$

$$\approx \boxed{0.877}$$

(b) $P(\text{AGAINST} \mid \text{UPPER}) = \boxed{\frac{18}{209}} \approx \boxed{0.086}$

$$= \frac{P(\text{UPPER AND AGAINST})}{P(\text{UPPER})} = \frac{\frac{18}{653}}{\frac{209}{653}} = \frac{18}{209}$$

(c) $P(\text{IN FAVOR OR MIDDLE CLASS}) =$

$P(\text{IN FAVOR}) + P(\text{MIDDLE CLASS}) - P(\text{IN FAVOR AND MIDDLECLASS})$

$$\frac{619}{653} + \frac{80}{653} - \frac{75}{653} = \boxed{\frac{624}{653}} \approx \boxed{0.956}$$

(d) $P(\text{AGAINST AND AGAINST AND AGAINST AND AGAINST}) =$

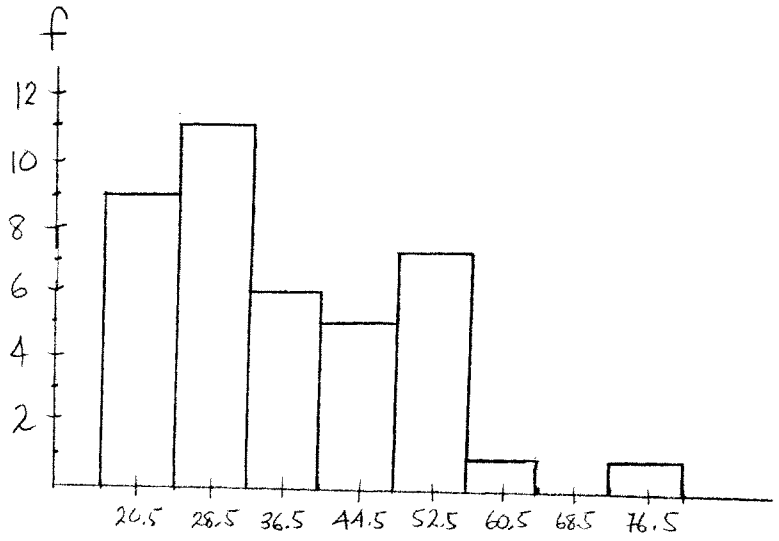
$$= \frac{34}{653} \cdot \frac{33}{652} \cdot \frac{32}{651} \cdot \frac{31}{650}$$

$$\approx \boxed{6.18\ E-6} \approx \boxed{0.000006}$$

(2) (a)

LOWER BOUNDARY	LOWER LIMIT	UPPER LIMIT	UPPER BOUNDARY	CLASS CENTER	FREQUENCY
16.5	17	24	24.5	20.5	9
24.5	25	32	32.5	28.5	11
32.5	33	40	40.5	36.5	6
40.5	41	48	48.5	44.5	5
48.5	49	56	56.5	52.5	7
56.5	57	64	64.5	60.5	1
64.5	65	72	72.5	68.5	0
72.5	73	80	80.5	76.5	1

(b)



MEN'S AGES

(c)

(d)

STEM	LEAVES
1	7 7 8 8
2	0 0 0 0 2 5 6 6 8 8 9 9
3	1 2 2 3 3 4 6 7
4	0 1 1 2 4 6
5	2 2 3 3 4 5 6 8
6	
7	3

(3) (a) $\bar{x} = \frac{\Sigma x}{n}$ $\bar{x} = \frac{1419}{40}$ $\bar{x} \approx \boxed{35.5}$

(b)

MIN	=	17
Q_1	=	25.5
MED	=	32.5
Q_3	=	45
MAX	=	73

(c) $s \approx \boxed{13.9}$ $s^2 \approx \boxed{193.9}$

$\bar{x} + 2s$ $35.5 + 2(13.9) \approx \underline{63.3}$

YES. SINCE 73 IS MORE THAN TWO STANDARD DEVIATIONS ABOVE THE MEAN IT IS UNUSUAL.

SORT DATA FIRST (d) PERCENTILE for X = $\frac{\text{NO. BELOW X}}{\text{TOTAL}} \cdot 100$ then roundoff

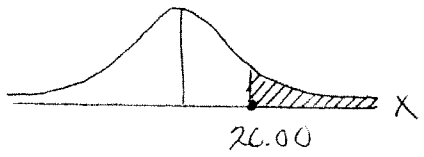
PERCENTILE for 25 = $\frac{9}{40} \cdot 100 = (.225)(100$

$= 22.\overline{5}$ ROUND OFF

$\boxed{23^{rd} \text{ PERCENTILE}}$

(4) $\mu = 19.70''$, $\sigma = 0.25''$, NORMAL DIST^n

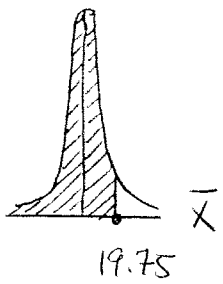
(a) $P(x > 20.00) =$



= normalcdf (20.00, 1E99, 19.70, 0.25)

$\approx$ **0.115**

(b) $P(\bar{x} < 19.75) =$

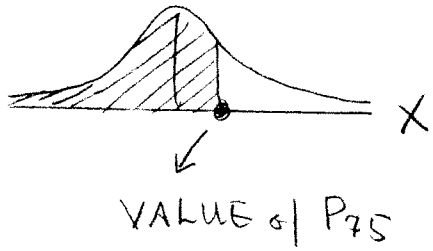


= normalcdf $\left(-1E99, 19.75, 19.70, \frac{0.25}{\sqrt{10}}\right)$

$\approx$ **0.736**

(c) P_{75} = invNorm (.75, 19.70, 0.25)

$\approx$ **19.9**



(d) $P(x > 20.50) =$ normalcdf (20.50, 1E99, 19.70, .25)

$\approx 6.87E-4$

≈ 0.0007

$\equiv$ **.07%**

(5)

YES, BINOMIAL
- ✓ F $n = 14$
- ✓ I
- ✓ T
- ✓ CONSTANT $p = 0.30$

(a) $P(x \geq 4) = 1 - \text{binomcdf}(14, .30, 3)$

$\approx \boxed{0.645}$

(b) $P(x = 6) = \text{binompdf}(14, .30, 6)$

$\approx \boxed{0.126}$

(c) $P(x \leq 8) = \text{binomcdf}(14, .30, 8)$

$\approx \boxed{0.992}$

(d) $\mu = np \quad \mu = (14)(.30) = \boxed{4.2}$

$\sigma = \sqrt{npq} \quad \sigma = \sqrt{(14)(.3)(.7)} \approx \boxed{1.7}$

$\mu + 2\sigma \quad 4.2 + 2(1.7) \approx 7.6$ upper bound

YES, UNUSUAL AS 8 OR MORE IS ABOVE THE MEAN + 2 STANDARD DEVIATIONS

OR

ALSO $P(x \geq 8) = 1 - \text{binomcdf}(14, .3, 7)$

$\approx \boxed{0.031}$ which is less than 5%, so UNUSUAL

(6) (a) $P(x \leq 42) = \text{binomcdf}(52, .90, 42) \approx$ **0.032**

YES, UNUSUAL. LESS THAN 5%.

(b)

x	P(x)
−50	.35
100	.65

$E = \mu = \Sigma x P(x)$ $E =$ **\$ 47.50**

(c) $n = 35$ 16 MALES, 19 FEMALES

$P(\text{M and M and M}) = \frac{16}{35} \cdot \frac{15}{34} \cdot \frac{14}{33} \approx$ **0.086**

(d) 2000 total, 40 defective, 1960 good

0 defect	at least 1 defect
ALL GOOD	1 or 2 or 3
1	

$P(x \geq 1) = 1 - P(\text{ALL GOOD})$

$= 1 - \left(\frac{1960}{2000} \cdot \frac{1959}{1999} \cdot \frac{1958}{1998}\right) \approx$ **0.059**

(e) $Z_{GB} = \frac{4.75 - 3.58}{.48} \approx$ **2.44** ← RELATIVELY HIGHER

$Z_{MILK} = \frac{1.38 - 1.27}{.13} \approx 0.85$

(f)

CLASS MID POINT (L1)	f (L2)
14.5	3
24.5	12
34.5	19
44.5	11
54.5	4

1-varstats L1, L2

$\bar{x} \approx$ **34.7**

$S \approx$ **10.3**