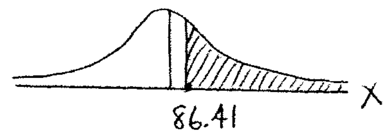
(1) NORMAL DISTRIBUTION: $\mu = 86.41$ $\sigma = 7.92$

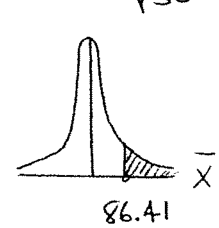
(a) $P(x > 88.00) = \text{normalcdf}(88.0, 1E99, 86.41, 7.92) =$

$\approx \boxed{0.420}$



(b) $P(\bar{x} > 88.00) = \text{normalcdf}\left(88.00, 1E99, 86.41, \frac{7.92}{\sqrt{50}}\right) =$

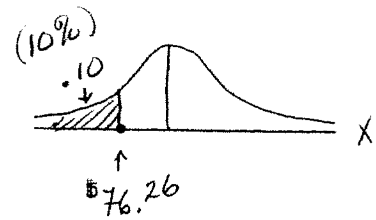
$\approx \boxed{0.078}$



(c) P_{10} is 10^{th} percentile

$X = \text{invNorm}(.10, 86.41, 7.92) =$

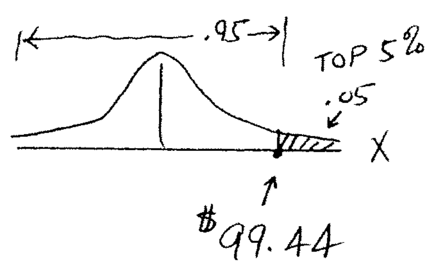
$\approx \boxed{\$76.26}$



(d) Top 5% is 95^{th} percentile

$X = \text{invNorm}(.95, 86.41, 7.92) =$

$\approx \boxed{\$99.44}$



(2) Reconstructed x: 33, 45, 46, 47, 51, 51, 52, 55, 58, 63, 64, 71

(a) $\bar{x} = \dfrac{\Sigma x}{n} \quad \bar{x} = \dfrac{636}{12} = \boxed{53}$

(b) $s = \sqrt{\dfrac{\sum (x-\bar{x})^2}{n-1}}$

x	$x-\bar{x}$	$(x-\bar{x})^2$
33	-20	400
45	-8	64
46	-7	49
47	-6	36
51	-2	4
51	-2	4
52	-1	1
55	2	4
58	5	25
63	10	100
64	11	121
71	18	324
		Σ = 1132

$s = \sqrt{\dfrac{1132}{11}}$

$s \approx \boxed{10.1}$

(c) $s^2 = \left(\sqrt{\dfrac{1132}{11}}\right)^2 = \dfrac{1132}{11} \approx \boxed{102.9}$

(d) $\tilde{x} = \dfrac{51+52}{2} = \boxed{51.5}$

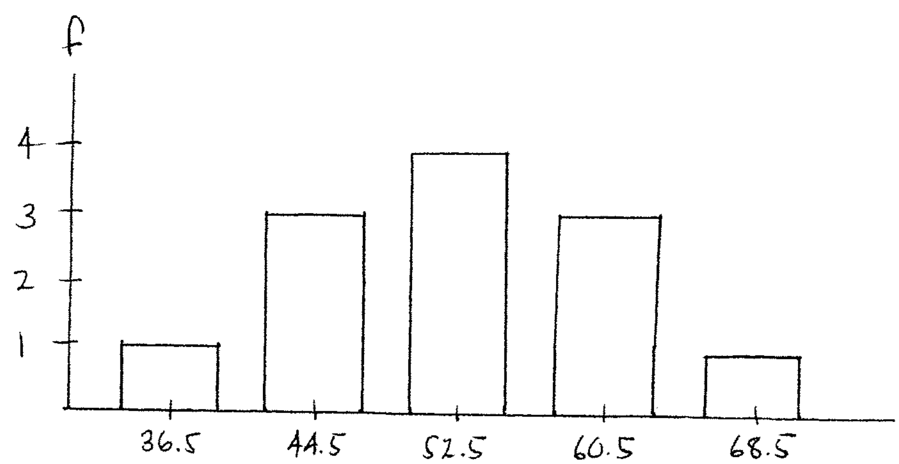
(e) MID-RANGE $= \dfrac{\text{MAX} + \text{MIN}}{2} = \dfrac{71+33}{2} = \boxed{52}$

(3) (a)

LOWER CLASS BOUNDARY	LOWER CLASS LIMIT	UPPER CLASS LIMIT	UPPER CLASS BOUNDARY	CLASS CENTER	FREQ	REL FREQ	CUM FREQ
32.5	33	40	40.5	36.5	1	1/12	1
40.5	41	48	48.5	44.5	3	3/12	4
48.5	49	56	56.5	52.5	4	4/12	8
56.5	57	64	64.5	60.5	3	3/12	11
64.5	65	72	72.5	68.5	1	1/12	12

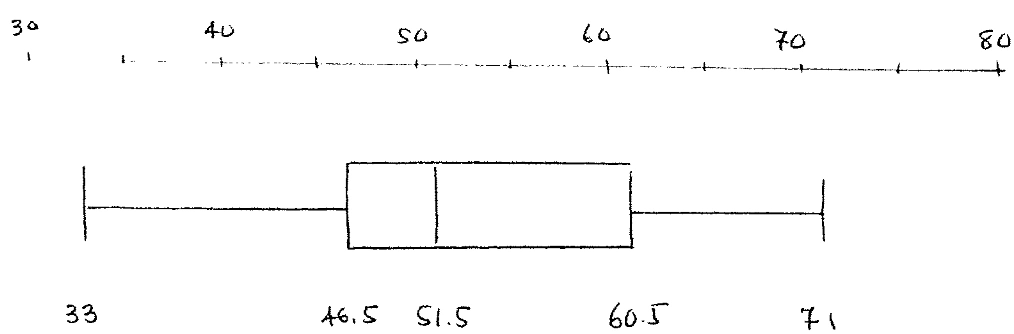
(b) see right two columns above

(c)



AGES OF GOLF PHYSICIANS
at Stanford on Wednesdays

(d)



(A) CONSTRUCT A TABLE:

		COLLEGE		
		GRADUATES	NON-GRADUATES	TOTALS
GENDER	MALE	3	4	7
	FEMALE	6	12	18
	TOTALS	9	16	$\boxed{25}$ GRAND TOTAL

(a) $P(\text{WOMAN}) = \boxed{\dfrac{18}{25}} = \boxed{.72}$

(b) $P(\text{MAN OR GRAD}) = P(\text{MAN}) + P(\text{GRAD}) - P(\text{MAN AND GRAD})$

$$= \frac{7}{25} + \frac{9}{25} - \frac{3}{25} = \boxed{\frac{13}{25}} = \boxed{.52}$$

(c) $P(\text{WOMAN AND WOMAN AND WOMAN}) = \dfrac{18}{25} \cdot \dfrac{17}{24} \cdot \dfrac{16}{23}$

$$= \boxed{\frac{204}{575}} \approx \boxed{0.355}$$

(d) $P(\text{GRAD} \mid \text{MAN}) = \boxed{\dfrac{3}{7}} = \dfrac{\frac{3}{25}}{\frac{7}{25}} \approx \boxed{0.429}$

(5) ✓ F $n=15$
✓ I
✓ T
✓ CONSTANT $p=0.70$

} yes, binomial

(a) $P(x \geq 9) = 1 - \text{binomcdf}(15, .7, 8) \approx \boxed{0.869}$

(b) $P(x = 10) = \text{binompdf}(15, .7, 10) \approx \boxed{0.206}$

(c) $P(x \leq 8) = \text{binomcdf}(15, .7, 8) \approx \boxed{0.131}$

(d) $\mu = np \qquad \mu = (15)(.7) = \boxed{10.5}$

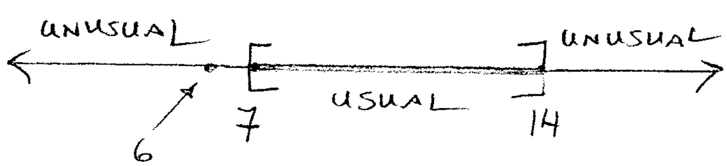
$\sigma = \sqrt{npq} \qquad \sigma = \sqrt{(15)(.7)(.3)} \approx \boxed{1.8}$

BOUNDS ON USUAL $\mu \pm 2\sigma$

$6.95 \leq \text{USUAL} \leq 14.05$

BUT THIS IS FROM A DISCRETE DIST^N^

$7 \leq \text{USUAL} \leq 14$



"...less than 7 people..." means 6 or fewer

YES, IT WOULD BE UNUSUAL BECAUSE 6 OR FEWER IS BELOW THE LEFT BOUND FOR "UNUSUAL".

ANOTHER METHOD:

$P(x \leq 6) = \text{binomcdf}(15, .7, 6) \approx \boxed{0.015}$

YES, $P(x \leq 6)$ IS LESS THAN 5%

(6) (a) $P(x > 72) = \text{normalcdf}(72, 1E99, 69.0, 2.8) \approx 0.141$

NOW MULTIPLY: $(.141) * (500)$

$\approx$ $\boxed{71 \text{ men}}$

(b) BINOMIAL, USE $\mu \pm 2\sigma$ $\quad 6 \leq \text{USUAL} \leq 14$

$\boxed{\text{BELOW 6 and ABOVE 14}}$ OR (5 and BELOW and 15 and above)

(c) BINOMIAL $P(x \geq 5) = 1 - \text{binomcdf}(10, .37, 4)$

$\approx \boxed{0.294}$

(d)

x	$P(x)$
75,000	.6
−150,000	.3
0	.1

$x \cdot P(x)$
45,000
−45,000
0

$\mu = E = 0$ NO!

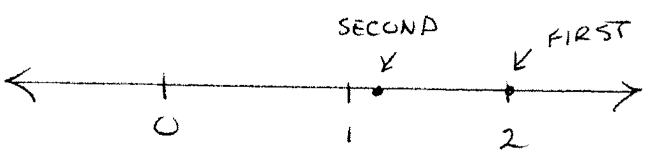
HER EXPECTED VALUE (the mean over many trials) IS \$0. So in the long run she would earn NOTHING. With a 30% chance of a big loss, and an average gain of Ø, HECK NO!

(e) 100 clocks, 12 defective, 88 good

P (GOOD AND GOOD AND GOOD) $= \frac{88}{100} \cdot \frac{87}{99} \cdot \frac{86}{98} \approx \boxed{0.679}$

(f) $Z_{\text{FIRST}} = \frac{80-70}{5} = \frac{10}{5} = \boxed{2}$ ← HIGH RELATIVE SCORE

$Z_{\text{SECOND}} = \frac{50-40}{8} = \frac{10}{8} = 1.25$



FIRST IS RIGHT MOST SO IT IS RELATIVE HIGH.