

①

| EVENT | X | P(X) |
|-------|---|---------------------------------|
| 2R1G | 2 | $C(2,2)C(8,1)/C(10,3) = 8/120$ |
| 1R2G | 1 | $C(2,1)C(8,2)/C(10,3) = 56/120$ |
| 0R3G | 0 | $C(2,0)C(8,3)/C(10,3) = 56/120$ |

$$E(X) = 2(8/120) + 1(56/120) + 0(56/120) = 72/120 = .6 \text{ orange}$$

② $n(S) = 10 \cdot 10 \cdot 10 \cdot 10 = 10000$
 $n(E) = 10 \cdot 10 \cdot 10 \cdot \frac{1}{a^7} + \frac{1}{a^6} \cdot 10 \cdot 10 \cdot 10 - \frac{1}{a^6} \cdot 10 \cdot 10 \cdot \frac{1}{a^7} = 1900$
 $P(E) = 1900/10000 = .19$

③

$P(S|L) = \frac{P(S \cap L)}{P(L)} = \frac{(2/3)(1/6)}{(2/3)(1/6) + (1/3)(1/5)}$
 $= \frac{12}{17}$

④ $P(\text{sum of 7}) = 6/36$ odds = $\frac{6/36}{30/36} \Rightarrow 1:5$

⑤ $P(0 \text{ bent}) = \frac{C(20,0) \cdot C(40,4)}{C(60,4)} = \frac{91390}{487,635} = \frac{962}{5133} (\approx .19)$

⑥

| | Broken | Not | TOT |
|-------|--------|-----|-----|
| CC | 3 | 13 | 16 |
| Sugar | 2 | 10 | 12 |
| Oat | 1 | 4 | 5 |
| TOT | 6 | 27 | 33 |

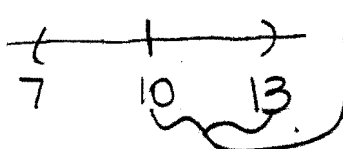
$P(\text{Oat} | \text{Broken}) = 1/6$

⑦ $X = \# \text{ of points (L1)}$ Freq = # of students (L2) total $n = 100$
 1-var Stats $L_1, L_2 \Rightarrow \text{mean} = \mu = 5.92$

Median = 7, $\sigma = 2.7191$, mode = 7

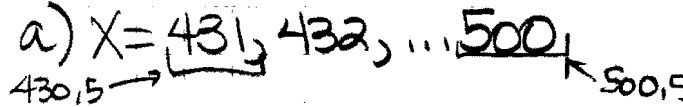
$Q_1 = 3.5, Q_3 = 8$

- ⑧ a) $X=1, 2, \dots$ inf. discrete
 b) $t \geq 0$ continuous (pick units)
 c) $X=0, 1, \dots, 100$ finite discrete

⑨ a)  $3 = k \cdot \sigma = k \cdot 1.1 \Rightarrow k = \frac{3}{1.1} = \frac{30}{11}$
 $P(7 \leq X \leq 13) \geq 1 - \frac{1}{(30/11)^2} = \frac{779}{900} (\approx .87)$

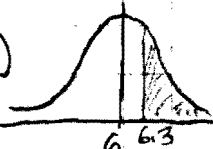
b) $.84 = 1 - \frac{1}{k^2} \rightarrow \frac{1}{k^2} = .16 \rightarrow \frac{1}{k} = .4 \rightarrow k = 2.5$
 $C = k\sigma = 2.5 \times 1.1 = 2.75$

⑩ binomial: success = survive, $N=500$, $p=.85$
 $\mu = Np = 425$, $\sigma = \sqrt{Np(1-p)} = \sqrt{63.75}$

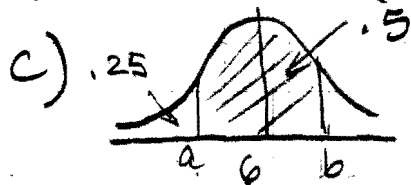
a) $X=431, 432, \dots, 500$  normalcdf(430.5, 500.5, μ, σ)
 $= 0.2455$

b) $X=9, \dots, 409 \rightarrow \text{normalcdf}(-.5, 409.5, 425, \sqrt{63.75}) = 0.0261$

c) $X=421, \dots, 424 \rightarrow \text{normalcdf}(420.5, 424.5, 425, \sqrt{63.75}) = 0.1885$

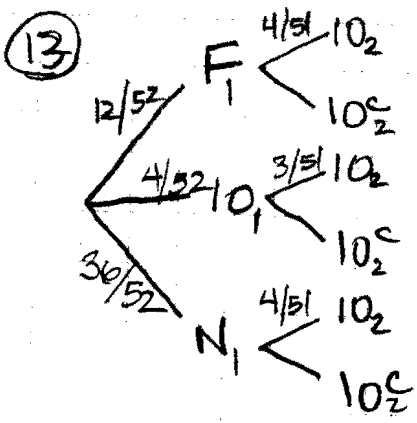
⑪ a)  normalcdf(6.3, 1E99, 6, .4) = .2266

b) normalcdf(5.6, 6, .4) = .4938



$a = \text{invNorm}(.25, 6, .4) = 5.73 \text{ cm}$

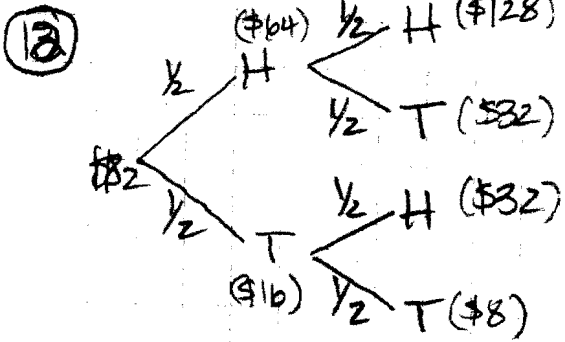
$b = \text{invNorm}(.75, 6, .4) = 6.27 \text{ cm}$



$$P(F_1 | 10_2) = \frac{P(F_1 \cap 10_2)}{P(10_2)}$$

$$= \frac{(12/52)(4/51)}{(12/52)(4/51) + (4/52)(3/51) + (36/52)(4/51)}$$

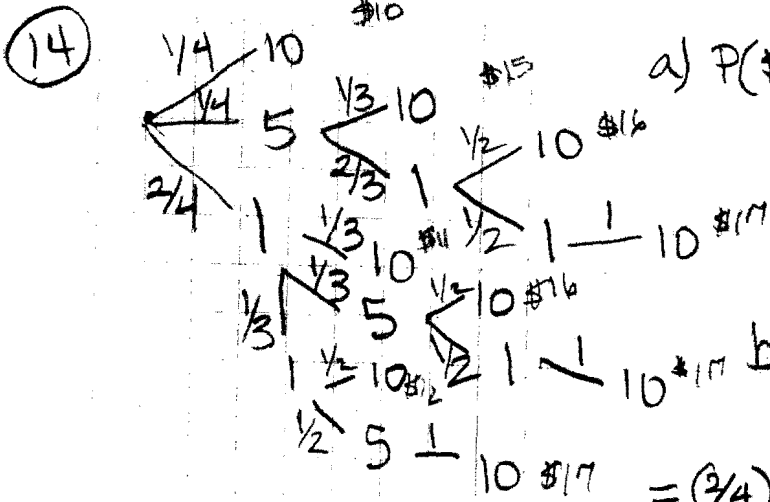
$$= \frac{48}{204} = \frac{4}{17}$$



| EVENT | X | P(X) |
|-------|-----|------|
| HH | 128 | 1/4 |
| HT | 32 | 1/4 |
| TH | 32 | 1/4 |
| TT | 8 | 1/4 |

$$E = 128(1/4) + 32(1/2) + 8(1/4)$$

$$= \$50$$



a) $P(\$16) = P(5 \cap 1 \cap 10) + P(1 \cap 5 \cap 10)$

$$= (1/4)(2/3)(1/2) + (2/4)(1/3)(1/2)$$

$$= 1/6$$

b) $P(1 \cap 5 \cap 10 \cap 10) + P(1 \cap 1 \cap 5 \cap 10) + P(5 \cap 1 \cap 10)$

$$= (2/4)(1/3)(1/2)(1) + (2/4)(1/3)(1/2)(1) + (1/4)(2/3)(1/2)(1)$$

$$= .25$$

c) $P(5 \cap 10) + P(1 \cap 10) = (1/4)(1/3) + (2/4)(1/3) = .25$