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Binomial probability Distribution

$$f(x) = \binom{n}{x} p^x (1-p)^{n-x}$$

(21) Given sucess : 23% $\therefore p = 0.23$

$x = 2 \quad n = 6 \qquad (1-p) = 0.77$

(a) $f(x) = \binom{n}{x} p^x (1-p)^{n-x}$

$f(2) = \binom{6}{2} p^2 (1-p)^4 = \binom{6}{2} (0.23)^2 (0.77)^4$

$= (15)(0.0529)(0.3515)$

$f(2) = 0.2789$

(b) $P(x \geq 2) = f(2) + f(3) + f(4) + f(5) + f(6)$

$$\left.\begin{aligned} f(2) &= 0.2789 \\ f(3) &= 0.1111 \\ f(4) &= 0.0249 \\ f(5) &= 0.0030 \\ f(6) &= 0.0001 \end{aligned}\right\} = 0.4180 //$$

(c) $n = 10 \quad x = 0$

$f(0) = \binom{10}{0} (0.23)^0 (0.77)^{10}$

$f(0) = 0.0733 //$

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(29) Given $p = 30\% = 0.30$ $(1-p) = 0.70$

(a) $n = 10$ $x = 3$

$$f(3) = \binom{10}{3}(0.30)^3(0.70)^7$$

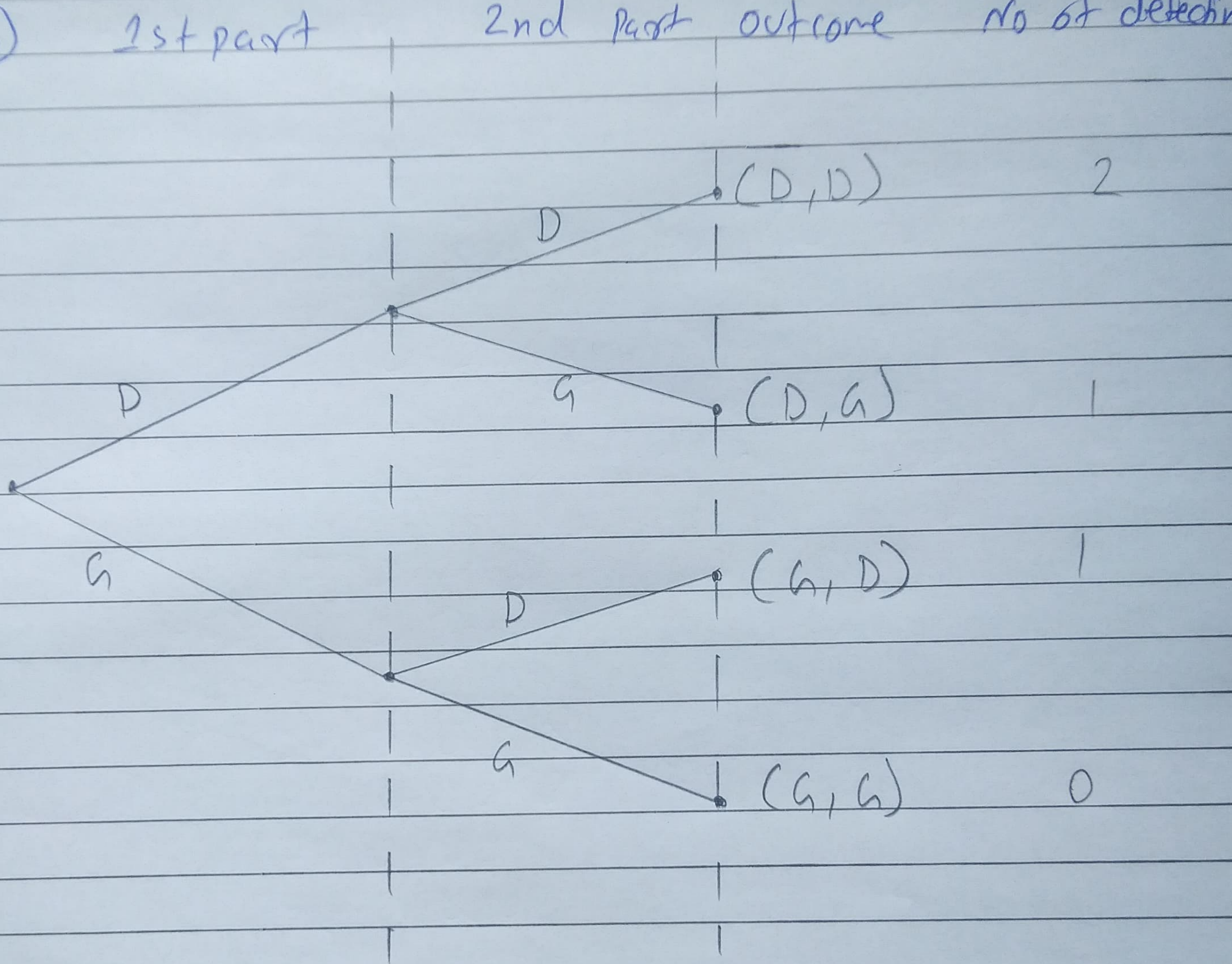
$$f(3) = 0.2668$$

(b) $P(x \geq 3) = f(3) + f(4) + f(5) \ldots f(10).$

$$\left.\begin{aligned} f(3) &= 0.2668 \\ f(4) &= 0.2001 \\ f(5) &= 0.1029 \\ f(6) &= 0.0368 \\ f(7) &= 0.0090 \\ f(8) &= 0.0014 \\ f(9) &= 0.0001 \\ f(10) &= 0.0000 \end{aligned}\right\} = 0.6171.$$

(30) (a) Probability of a defective part being produced must be 0.03 for each part selected. parts must be selected independently.

(b)



(c) Two outcomes with exactly one defective found.

(d) $P(\text{no defects}) = \binom{2}{0}(0.03)^0(0.97)^2 = 0.9409$

$P(1\ \text{defects}) = \binom{2}{1}(0.03)^1(0.97)^1 = 0.0582$

$P(2\ \text{defects}) = \binom{2}{2}(0.03)^2(0.97)^0 = 0.0009$