

①

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A = 1N52 105H

B = 1N52 818H

$$P(B \cap \bar{A}) = 0.07, \quad P(\bar{A} \cap \bar{B}) = 0.01$$

$$P(A \cap \bar{B}) = 0.02$$

	A	$\bar{A}$	
B	0.9	0.07	0.97
$\bar{B}$	0.02	0.01	0.03
	0.92	0.08	

1) $P(A \cap B) = \boxed{0.9}$

2) $P(\bar{B}/A) = \frac{P(A \cap \bar{B})}{P(A)} = \frac{0.02}{0.92} = \boxed{0.0217}$

3) $\binom{10}{9} (0.97)^9 (0.03) + (0.97)^{10} = \boxed{0.965}$

4) $\binom{10}{8} (0.9)^8 (0.02)^2 = \boxed{0.0077}$

② $S \sim N(100\mu, 10\sigma)$

$P(S < 52.6) = 0.8$

$P\left(Z < \frac{52.6 - 100\mu}{10\sigma}\right) = 0.8$

$\Phi\left(\frac{52.6 - 100\mu}{10\sigma}\right) = 0.8$

(2)

$$\frac{52.6 - 100\mu}{10\sigma} = Z_{0.8} = 0.84$$

$$(1) 10\sigma = \frac{52.6 - 100\mu}{0.84}$$

$$P(S < 59.2) = 0.9$$

$$\frac{59.2 - 100\mu}{10\sigma} = 1.28$$

$$10\sigma = \frac{59.2 - 100\mu}{1.28} = \frac{52.6 - 100\mu}{0.84}$$

$$\mu = 0.4, \sigma = 1.5$$

$$S \sim N(40, 15)$$

$$P(S < K) = 0.99$$

$$\frac{K - 40}{1.5} = Z_{0.99} = 2.33$$

$$\boxed{K = 74.95}$$

$$(3) 1) a \left(\int_{-1}^0 \frac{1}{2} dx + \int_0^{\infty} e^{-2x} dx \right) = 1$$

$$a \left(\left. \frac{x}{2} \right|_{-1}^0 + \left. \frac{e^{-2x}}{-2} \right|_0^{\infty} \right) = 1$$

$$a \left(\frac{1}{2} + \frac{1}{2} \right) = 1 \rightarrow \boxed{a = 1}$$

(3)

$$2) E(x) = \int_{-1}^0 \frac{x}{2} dx + \int_0^{\infty} x e^{-2x} dx$$

$$\left[\begin{array}{ll} f = x & g' = e^{-2x} \\ f' = 1 & g = \frac{e^{-2x}}{-2} \end{array} \right]$$

$$= \frac{x^2}{4} \Big|_{-1}^0 + \frac{x e^{-2x}}{-2} \Big|_0^{\infty} + \int_0^{\infty} \frac{e^{-2x}}{2} dx$$

$$= -\frac{1}{4} + 0 + \frac{e^{-2x}}{-4} \Big|_0^{\infty} = -\frac{1}{4} + \frac{1}{4} = \boxed{0}$$

$$\text{Var}(x) = E(x^2) - 0^2 = \int_{-1}^0 \frac{x^2}{2} dx + \int_0^{\infty} x^2 e^{-2x} dx$$

$$\left[\begin{array}{ll} f = x^2 & g' = e^{-2x} \\ f' = 2x & g = \frac{e^{-2x}}{-2} \end{array} \right]$$

$$= \frac{x^3}{6} \Big|_{-1}^0 + \frac{x^2 e^{-2x}}{-2} \Big|_0^{\infty} + \int_0^{\infty} \frac{x e^{-2x}}{1} dx$$

$$= \frac{1}{6} + 0 + \frac{1}{4} = \boxed{\frac{5}{12}}$$

4)

A = 8 2 1 2

 $\bar{A}$ = 8 2 1 2 8 1

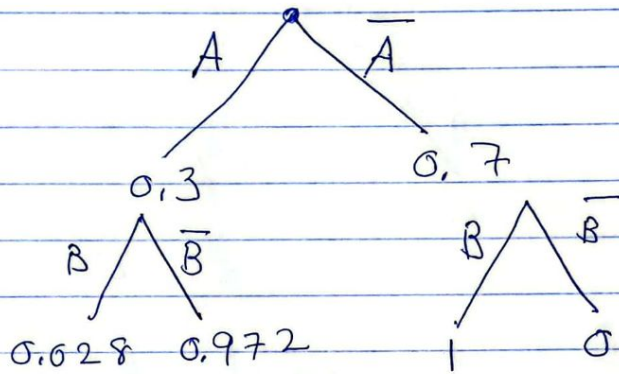
B = 8 2 1 2 8 1 1 3 7 0 2

 $P(A) = 0.3$ $P(\bar{A}) = 0.7$

(4)

$$P(B/A) = \binom{3}{2} (0.1)^2 (0.9) + (0.1)^3 = 0.028$$

$$P(B/\bar{A}) = 1$$



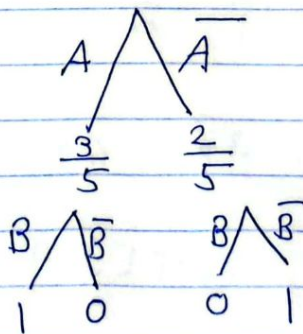
$$P(A/B) = \frac{P(B/A) \cdot P(A)}{P(B)} = \frac{(0.028)(0.3)}{(0.028)(0.3) + 0.7}$$

$$= \boxed{0.012}$$

5) A = ארבעה פסוקים נכונים

B = ארבעה פסוקים שגויים

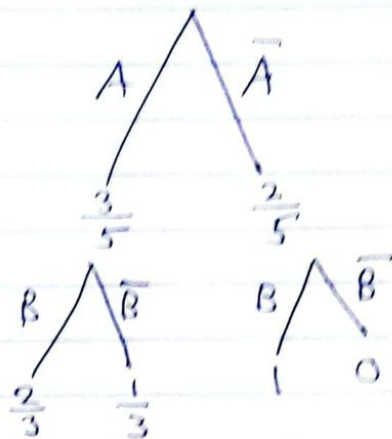
הסתברות ארבעה פסוקים נכונים



$$P(B) = 1\left(\frac{3}{5}\right) + 0\left(\frac{2}{5}\right) = \boxed{\frac{3}{5}}$$

(5)

2) מהי ההסתברות ש A יבחר את B?



$$P(B) = \frac{2}{3} \cdot \frac{3}{5} + (1) \cdot \left(\frac{2}{5}\right) = \frac{6}{15} + \frac{2}{5}$$

$$= \frac{12}{15} = \boxed{\frac{4}{5}}$$

6) 1) $1 - \frac{9 \cdot 4! \cdot \binom{6}{4} \cdot 32 \cdot 31}{36 P_6} = \boxed{0.998}$

$= 1 - P(\text{פרסומים 4 פרסומים בלבד})$

$9 \Rightarrow$ שני פרסומים

$\binom{6}{4} \Rightarrow$ 6 פרסומים
4 פרסומים

$4! \Rightarrow$ סידורים של 4 פרסומים

$32 \cdot 31 \Rightarrow$ אבסולוטים של 4 פרסומים
הן לא ר"ה

⑥

$$2) \frac{9 \cdot \binom{6}{3} \cdot (4P_3) \cdot 8 \cdot \binom{3}{2} \cdot (4P_2) \cdot 28}{36 P_6}$$

$$= \boxed{0.0248}$$