① If an experiment has three possible and mutually exclusive outcomes A, B, and C, check in each case whether the assigment of probabilities is permissible;

(a) $P(A)=\frac{1}{3}$, $P(B)=\frac{1}{3}$, and $P(C)=\frac{1}{3}$.

(b) $P(A)=0.64$, $P(B)=0.38$, and $P(C)=-0.02$.

(c) $P(A)=0.35$, $P(B)=0.52$, and $P(C)=0.26$.

(d) $P(A)=0.57$, $P(B)=0.24$, and $P(C)=0.19$.

② If A and B are mutually exclusive events, $P(A)=0.25$, and $P(B)=0.45$, find

(a) $P(\bar{A})$; (b) $P(A\cup B)$; (c) $P(\bar{B})$; (d) $P(A\cap\bar{B})$; (e) $P(\bar{A}\cap\bar{B})$

③ Given $P(A)=0.35$, $P(B)=0.4$, and $P(A\cap B)=0.2$, find: (a) $P(A\cup B)$, (b) $P(\bar{A}\cap B)$, (c) $P(A\cap\bar{B})$, (d) $P(\bar{A}\cup\bar{B})$; (e) Are A and B independent?

④ Show that

(a) $P(A\cap B)\leq P(A)$;

(b) $P(A\cup B)\geq P(A)$.

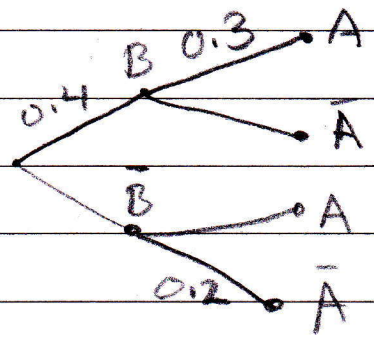
⑤ Use the information on the tree diagram dipected below to determine the value of

(a) $P(A)$

(b) $P(B)$

(c) $P(B/A)$

(d) $P(B/\bar{A})$



⑥ A company rents cars from three agencies, 20% from agency A, 20% from agency B, and 60% from agency C. If 10% of the cars from A, 12% of the cars from B, and 4% of the cars from C have bad tires,

(a) What is the probability that the company will get a car with bad tires?

(b) What is the probability that a car with bad tires rented by the company came from agency C.

⑦ The following frequency table shows the classification of 58 landfills in a country according to their concentration of the three hazardous chemicals: arsenic, barium, and mercury.

		Barium			
		High		Low	
		Mercury		Mercury	
		High	Low	High	Low
Arsenic	High	1	3	5	9
	Low	4	8	10	18

If a landfill is selected at random, find the probability that it has

(a) a high concentration of mercury;

(b) a high concentration of barium and

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and low concentration of arsenic and mercury.

(c) a high concentration of any two of the chemicals and low concentration of the third.

(d) a high concentration of any one of the chemicals and low concentrations of the other two.

(e) Given that a landfill, selected at random, is found to have a high concentration of barium, what is the probability that its concentration is

(1) high in mercury?

(2) low in both arsenic and mercury?

(3) high in either arsenic or mercury?

(8) If events A and B are independent and $P(A) = 0.45$ and $P(B) = 0.3$, find

(a) $P(A \cap B)$, (b) $P(A/B)$

(c) $P(A \cup B)$, (d) $P(\bar{A} \cap \bar{B})$