Домашняя работа
(ЛДНФ)

ПНФ объединения пересечений

1. $E=((A\cap\bar B)\cup\overline{(A\cap\bar C)})\cap(\overline{(A\cap C)\cup(\bar A\cap C)}\cup(A\cap B))=$

$=((A\cap\bar B)\cup(\bar A\cup C))\cap((\bar A\cup\bar C)\cap(A\cup\bar C)\cup(A\cap B))=$

$=((A\cap\bar B)\cup(\bar A\cup C))\cap(((\bar A\cup\bar C)\cap A)\cup((\bar A\cup\bar C)\cap\bar C)\cup(A\cap B))=$

$=(A\cap\bar B)\cup(\bar A\cup C)\cap((\underbrace{A\cap\bar A}_{\varnothing})\cup(A\cap\bar C))\cup((A\cap\bar C)\cup(\underbrace{\bar C\cap\bar C}_{\bar C}))\cup$

$\cup(A\cap B))=(A\cap\bar B)\cup(\bar A\cup C)\cap(A\cap\bar C)\cup\underbrace{(A\cup\bar C)\cap\bar C}_{(A\cap\bar C)\cup\bar C}\cup(A\cap B)=$

$=(A\cap\bar B)\cup(\bar A\cup\bar C)\cap\underbrace{(A\cap C)\cup(A\cap\bar C)}_{(A\cup(C\cup A))\cap(A\cup(C\cup\bar C))}\cup\bar C\cup(A\cup B)=$

$=(A\cap\bar B)\cup(\bar A\cup C)\cap(A\cup C)\cap(A\cup U)\cup(A\cup B\cup\bar C)=$

$=(A\cap\bar B)\cup\underbrace{(\bar A\cap C\cap A)}_{\varnothing}\cup(\bar A\cap C\cap C)\cap(A\cup U)\cup(A\cup B\cup\bar C)=$

$=(A\cap\bar B)\cup(\varnothing)\cup((\bar A\cap C)\cap\underbrace{(A\cup U)}_{U})\cup(A\cup B\cup\bar C)=$

$=(A\cap\bar B)\cup(\bar A\cap U)\cup(C\cap U)\cup(A\cup B\cup\bar C)=$

$=(A\cap\bar B)\cup(\bar A)\cup(C)\cup(A\cup B\cup\bar C)=(A\cap\bar B)\cup(\underbrace{A\cup\bar A}_{U}\cup B\cup$

$\cup\underbrace{\bar C\cup C}_{U})=(A\cap\bar B)\cup(\underbrace{B\cup\bar B}_{U})=(A\cap\bar B)\cup(U)$

2. $E=((A\cap B)\cup\overline{(B\cap\bar C)})\cap\overline{((B\cap C)\cup(\bar A\cap C))}=$

$=((A\cap\bar B)\cup(\bar B\cup C))\cap((\bar B\cup\bar C)\cap(A\cup\bar C))=$

$=(A\cap\bar B)\cup\bar B)\cup C)\cap\underbrace{(A\cap\bar C)\cup(\bar B\cap\bar C)\cup(\underbrace{\bar C\cap\bar C}_{\bar C})}_{\bar C}\cup(A\cap\bar B)=$

$=(\bar B\cup C)\cap((A\cap\bar B)\cup\bar C)=(\bar B\cup C)\cap(\bar A\cap\bar C)\cup(\bar B\cup\bar C)=$

$=(\bar B\cup C)\cap(C\cap A)\cup(\bar B\cup\bar C)=$

$=(C\cap A)\cup(\bar B\cap\bar C)=((C\cap A)\cap U)\cup((\bar B\cap\bar C)\cap U)=$

$= ((C \cap A) \cap (B \cup \bar{B})) \cup ((\bar{B} \cap \bar{C}) \cap (A \cup \bar{A})) = ((C \cap A) \cap B) \cup$

$((C \cap A) \cap \bar{B}) \cup ((\bar{B} \cap \bar{C}) \cap A) \cup (\bar{B} \cap \bar{C}) \cap \bar{A}) =$

$= (A \cap B \cap C) \cup (A \cap \bar{B} \cap C) \cup (A \cap \bar{B} \cap \bar{C}) \cup (\bar{A} \cap \bar{B} \cap \bar{C}) =$

z

3. $(A \cap \bar{B}) \cup (B \cap C) \cup (\bar{A} \cap B \cap \bar{C}) = ((A \cap \bar{B}) \cap (C \cup \bar{C})) \cup$

$\cup (B \cap C) \cap (A \cup \bar{A}) \cup (\bar{A} \cap B \cap \bar{C}) = (A \cap \bar{B} \cap C) \cup (A \cap \bar{B} \cap \bar{C}) \cup$

$\cup (A \cap B \cap C) \cup (\bar{A} \cap B \cap C) \cup (\bar{A} \cap B \cap \bar{C})$

Полная нормальная форма пересечения объединения. (ПКНФ)

1) $A \cup (\bar{B} \cap \bar{C}) = (A \cup \bar{B}) \cap (A \cup \bar{C}) = ((A \cup \bar{B}) \cup \emptyset) \cap ((A \cup \bar{C}) \cup \emptyset) =$

$= ((A \cup \bar{B}) \cup (C \cap \bar{C})) \cap ((A \cup \bar{C}) \cup (B \cap \bar{B})) = ((A \cup \bar{B}) \cup C) \cap ((A \cup \bar{B}) \cup$

$\cup \bar{C}) \cap ((A \cup \bar{C}) \cup B)) \cup ((A \cup \bar{C}) \cup \bar{B})) = (A \cup \bar{B} \cup C) \cap \underline{(A \cup \bar{B} \cup \bar{C})} \cap$

$\cap (A \cup B \cup \bar{C}) \cup \underline{(A \cup \bar{B} \cup \bar{C})} = (A \cup \bar{B} \cup C) \cap (A \cup \bar{B} \cup \bar{C}) \cap$

$\cap (A \cup B \cup \bar{C})$

2) $(A \cup B) \cap (B \cup C) \cap (\bar{A} \cup B \cup \bar{C}) = (A \cup B) \cup \emptyset) \cap$

$(B \cup C) \cup \emptyset) \cap (\bar{A} \cup B \cup \bar{C}) = ((A \cup B) \cup (C \cap \bar{C})) \cap ((B \cup C) \cup (A \cap \bar{A})) \cap$

$\cap (\bar{A} \cup B \cup \bar{C}) = \underline{(A \cup B \cup C)} \cap (A \cup B \cup \bar{C}) \cap \underline{(A \cup B \cup C)} \cap$

$\cap (\bar{A} \cup B \cup C) \cap (\bar{A} \cup B \cup \bar{C}) = (A \cup B \cup C) \cap (A \cup B \cup \bar{C}) \cap$

$\cap (\bar{A} \cup B \cup C) \cap (\bar{A} \cup B \cup \bar{C})$

3). $A \cup (\bar{B} \cap \bar{C}) \cap (A \cup \bar{B}) = (A \cup \bar{B}) \cap (A \cup \bar{C}) \cap (A \cup \bar{B}) =$

$= ((A \cup \bar{B}) \cup \emptyset) \cap ((A \cup \bar{C}) \cup \emptyset) \cap ((A \cup \bar{B}) \cup \emptyset) = ((A \cup \bar{B}) \cup (C \cap \bar{C})) \cap$

$\cap((A \vee \bar{C}) \vee (B \cap \bar{B})) \cap ((A \vee \bar{B}) \vee (C \cap \bar{C})) = (A \vee B \vee C) \cap$

$\cap(\underline{A \vee B \vee \bar{C}}) \cap (\underline{A \vee B \vee \bar{C}}) \cap (\underline{\underline{A \vee \bar{B} \vee \bar{C}}}) \cap (A \vee \bar{B} \vee C) \cap (\underline{\underline{A \vee \bar{B} \vee}}$

$\underline{\underline{\vee \bar{C}}}) = (A \vee B \vee C) \cap (A \vee B \vee \bar{C}) \cap (A \vee \bar{B} \vee \bar{C}) \cap (A \vee \bar{B} \vee C)$