Широков Олег. Группа 1120.

Задание 1

1. $\overline{\exists x A(x)} \equiv \forall x \overline{A(x)}.$
2. $C \vee \forall x B(x) \equiv \forall x[C \vee B(x)]$
3. $\forall x A(x) \equiv \overline{\exists x \overline{A(x)}}.$
4. $\exists x A(x) \equiv \overline{\forall x \overline{A(x)}}.$
5. $\overline{\forall x A(x)} \equiv \exists x \overline{A(x)}.$
6. $C \rightarrow \forall x B(x) \equiv \forall x[C \rightarrow B(x)]$
7. $\exists x[C \vee B(x)] \equiv C \vee \exists x B(x).$
8. $\forall x A(x) \wedge \forall x B(x) \equiv \forall x[A(x) \wedge B(x)]$
9. $C \wedge \forall x B(x) \equiv \forall x[C \wedge B(x)]$.
10. $\forall x[B(x) \rightarrow C] \equiv \exists x B(x) \rightarrow C.$
11. $\exists x[A(x) \vee B(x)] \equiv \exists x A(x) \vee \exists x B(x).$
12. $\exists x[C \wedge B(x)] \equiv C \wedge \exists x B(x).$

Задание 2.

1. $\forall x\ (F(x)\ \&\ G(x)) \equiv \forall x\ F(x)\ \&\ \forall x\ G(x)$
2. $\exists x\ (F(x) \vee G(x)) \equiv \exists x\ F(x) \vee \exists x\ G(x)$
3. $\forall x \forall y\ F(x, y) \equiv \forall y \forall x\ F(x, y)$
4. $\exists x \exists y\ F(x, y) \equiv \exists y \exists x\ F(x, y)$
5. $\neg(\forall x\ F(x)) \equiv \exists x\ \neg F(x)$
6. $\neg(\exists x\ F(x)) \equiv \forall x\ \neg F(x)$

Задание 3.

$F = \exists z A(z) \vee (\exists x[B(x) \rightarrow C(z)] \rightarrow [\forall y D(y, x) \rightarrow S(x)])$

$\equiv \exists z A(z) \vee \overline{(\exists x[B(x) \rightarrow C(z)])} \vee \overline{\forall y D(y, x)} \vee S(x)$

$\equiv \exists z A(z) \vee \forall x \overline{B(x)} \vee C(z) \vee \exists y D(y, x) \vee S(x)$

Задание 4.

$[\exists x \forall y A(x, y) \rightarrow \exists x \exists y B(x, y)] \vee \forall x \exists y C(x, y) \equiv \overline{\exists x \forall y A(x, y)} \vee \exists x \exists y B(x, y) \vee \forall x \exists y C(x, y)$

$\equiv \forall x \exists y \overline{A(x, y)} \vee \exists x \exists y B(x, y) \vee \forall x \exists y C(x, y) \equiv \exists y(\forall x \overline{A(x, y)} \vee \exists x B(x, y) \vee \forall x C(x, y))$

$\equiv \exists y[\forall x(\overline{A(x, y)} \vee C(x, y)) \vee \exists x B(x, y)]$

Задание 5

Определение непрерывности функции нескольких переменных в точке определённой на E.

$\forall \varepsilon>0 \exists \delta>0 \forall M(x, y) \in E((|x-x_0|<\delta)(|y-y_0|<\delta) \rightarrow |f(x, y)-f(x_{0,} y_0)|<\varepsilon)$

$\forall \varepsilon>0 \exists \delta>0 \forall M(x, y) \in E(P(\varepsilon, \delta, M))$

$P(\varepsilon, \delta, M)=((|x-x_0|<\delta)(|y-y_0|<\delta) \rightarrow |f(x, y)-f(x_{0,} y_0)|<\varepsilon)$