б) $\mathbb{N}_0$

$\exists y \exists z \forall x \; S(x,y,z) = 1$ $\quad (0 \dots +10) + y = z$

$\exists y \exists z \forall x \; \Pi(x,y,z) = 1$ $\quad (0 \dots +10) \cdot y = z$

$\forall z \forall x \exists y \; S(x,y,z) = 1$ $\quad (0 \dots +10) + y = (0 \dots +10)$

$\forall z \forall x \exists y \; \Pi(x,y,z) = 0$ $\quad$ т.к. числа должны быть целыми

⑥ а) $P(x,y) : x \mid y \quad \in \mathbb{N}$

$\forall x \forall y \; P(x,y) = 0$ $\quad 7 \mid 2 = 3,5$

$\exists y \exists y \; P(x,y) = 1$

$\forall x \exists y \; P(x,y) = 1$

$\exists x \forall y \; P(x,y) = 1$

2) $P(x,y) : x + y$ целое число, $\in \mathbb{N}$

$\forall x \forall y \; P(x,y) = 0$ $\quad 1 + ? = 3$

$\exists x \exists y \; P(x,y) = 1$

$\forall x \exists y \; P(x,y) = 1$

$\exists x \forall y \; P(x,y) = 1$

$P(x)$ - $x$ кратно 3 $\{1, ?, 4, 5, 6, 7, 8, 10 \dots\}$

$Q(x)$ - кратно 5 $\{1, ?, 3, 4, 6, 7, 8, 9, 11 \dots\}$

$P \& Q = \{1, ?, 4, 7, 8, 11, 13, 14, 16, 17, 19, ??, 23 \dots\}$

$P \vee Q = \{1, ?, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, \dots, ?5, 31\}$

$P \to Q = \bar{P} \vee Q = \{1, ?, 3 \dots\}$ весь р.сд

$\bar{P} \to Q = \bar{\bar{P}} \vee Q = P \vee Q$

$Q \to P = \bar{Q} \vee P = \{1, ?, 4, 5, 7, 8, 10, 11, 13, 14, 15, \dots, 30\}$

Д/З Рисин с 26

② а) $P(x) = \exists y\, S(y,y,x)$ : $y+y=x$

$\forall x\, P(x) = 1$ да

$\exists x\, P(x) = 1$ да

б) $P(x) = \forall y\, \Pi(x,y,y)$ : $xy=y$

$\forall x\, P(x) = 0$ нет

$\exists x\, P(x) = 1$ да

④ а) $\forall x\, P(x,a)=0$; $\exists x\, P(x,a)=0$

$\forall y\, P(a,y)=1$, $y=a$

$\forall y\, P(a,y)=0$ $y=a$

$\exists y\, P(a,y)=1$, $y=a$

$\exists y\, P(a,y)=0$ $y\neq a$

б) $\forall x\, P(x,b)=1$ ; $\exists x\, P(x,b)=1$

$\forall y\, P(b,y)=1$, $y\neq a$

$\forall y\, P(b,y)=0$ $y=a$

$\exists y\, P(b,y)=1$ $y=a$

$\exists y\, P(b,y)=0$ $y\neq a$

в) $\forall x\, \forall y\, P(x,y)=0$ ; $\exists x\, \exists y\, P(x,y)=1$ ;

$\forall x\, \exists y\, (P(x,y)=1$ ; $\exists x\, \forall y\, P(x,y)=1$ ;

$\forall y\, \exists x\, P(x,y)=1$ ; $\exists y\, \forall x\, P(x,y)=1$ ;

⑤ $\Pi(x,y,z)$ : $xy=z$ $S(x,y,z)$ : $x+y=z$

а) $\mathbb{Z}$

$\exists y\, \exists z\, \forall x\, S(x,y,z)=1$ $\forall\, y=z$

$\exists y\, \exists z\, \forall x\, \Pi(x,y,z)=1$ $y..10 \cdot y=11/12...$

$\forall z\, \forall x\, \exists y\, S(x,y,z)=1$ $10\cdot y=11$

$\forall z\, \forall x\, \exists y\, \Pi(x,y,z)=0$ $y\in\mathbb{Y}$