DM HOMEWORK 4 (12 февраля 2016 г.)

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Problem 1.

a. $\forall x P(x) \rightarrow \sim Q(x)$

b. $\sim \exists S(x) \rightarrow R(x)$

c. $\forall x \sim Q(x) \rightarrow S(x)$

d. $\forall x P(x) \rightarrow \sim R(x)$

e. Yes

Problem 2.

a. Exists such figure that is both Circle and Ellipse. true

b. Exists such figure that is Circle and not Ellipse. false

c. All circles are ellipses. true

Problem 3.
$\sim (\forall x A(x) \rightarrow B(x)) = \exists x A(x) \wedge B(x)$
a, c

Problem 4.

a. true

b. true

c. false, 18

d. true

e. false, -6

Problem 5.
$\exists x \in \mathbb{R}, x^2 \geq 4 \wedge x \leq 2$

Problem 6.

a. false

    b. true

    c. false

    d. false

Problem 7.

    a. Exist such student that read LOTR

    b. All students read 50 shades of Gray

    c. Every student read at least one book

    d. Exist such book that read by every student

    e. Exist such book that read at least by two students

    f. Exist such pair of different students that one of them read all books that read other

Problem 8.

    a. false, $x = 1$

    b. true

    c. false, $x = 1, y = 1$

    d. true, $y = \frac{1}{x}$

    e. false, $x = 0$

    f. false, $x = 1, y = 10$ true

    g. true, $u = 1/10$

Problem 10.

    a. Universal Modus Tollens
       $C(x) - x$ is cat, $P(x) - x$ poors
       $\forall x C(x) \rightarrow P(x)$
       $\sim P(John)$

       $\overline{}$
       $\sim C(John)$

    b. Universal Modus Ponens
       $T(x) - x$ is teacher, $H(x) - x$ is handsome
       $\forall x T(x) \rightarrow H(x)$
       $T(Arthur)$

       $\overline{}$
       $H(Arthur)$

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c. Universal Modus Ponens
$R(x) - x$ is Russian, $H(x) - x$ is happy
$\forall x R(x) \rightarrow H(x)$
$R(GerardDepardieu)$

$\overline{}$
$H(GerardDepardieu)$

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