CS 173, Summer 19 Examlet 1

Name:_____

NetID:_____ **Lecture: A B**

Discussion: Monday & Wednesday 1:30 2:30

1. (5 points) State the negation of the following claim, moving all negations (e.g. "not") so that they are on individual predicates.

For every tiger k, if k is orange, then k is large and k is not friendly.

Solution: There is a tiger k such that k is not large or k is friendly, but k is orange.

2. (5 points) State the contrapositive of the following claim, moving all negations (e.g. "not") so that they are on individual predicates.

For every tiger k, if k is orange, then k is large and k is not friendly.

Solution: For every tiger k, if k is not large or k is friendly, then k is not orange.

3. (5 points) Find all integer solutions to the equation $2p^2 + 5p = 3$. Show your work.

Solution: Since $2p^2+5p = 3$, $2p^2+5p-3 = 0$. Factoring the lefthand side, we get $(p-\frac{1}{2})(2p+6) = 0$. So p must be either $\frac{1}{2}$ or -3. But $\frac{1}{2}$ is not an integer. So $p = -3$.

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1. (5 points) Simplify, showing your work.
   $25 \times 2^{-3\log_2(5)} =$

   Solution: $25 \times 2^{-3\log_2(5)} = 25 \times (2^{\log_2(5)})^{-3} = 25 \times 5^{-3} = 25 \times \frac{1}{125} = \frac{1}{5}$

2. (10 points) Check the (single) box that best characterizes each item.

   Shorthand for the set of integers. $\mathbb{J}$ ☐ $\mathbb{N}$ ☐ $\mathbb{W}$ ☐ $\mathbb{Z}$ ☑

   If U. Illinois is in Paris, then $\pi < 0$. true ☑ false ☐ undefined ☐

   $\lfloor -3.4 \rfloor$ -3 ☐ -4 ☑ 3.4 ☐ undefined ☐

   $\neg(p \wedge \neg q) \equiv \neg p \vee q$ true ☑ false ☐

   $p \to q \equiv \neg p \to \neg q$ true ☐ false ☑