

CS 173, Spring 2016
Examlet 1, Part B

NETID:

FIRST:

LAST:

Discussion: Monday 9 10 11 12 1 2 3 4 5

1. (5 points) Remembering that $\log$ takes only positive inputs, solve $\log_{10} x + \log_{10}(x - 3) = 1$ for x .

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

$$\neg(p \rightarrow q) \equiv \neg q \rightarrow \neg p$$

true

☐

false

☐

Shorthand for the set of integers.

$\mathbb{Z}$ ☐

$\mathbb{I}$ ☐

$\mathbb{N}$ ☐

$\mathbb{W}$ ☐

$$\log_7 5 < 1$$

true

☐

false

☐

$$6 \in \mathbb{C}$$

true

☐

false

☐

For any real number x , $2\lfloor x \rfloor = \lfloor 2x \rfloor$

true

☐

false

☐

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1. (5 points) Express $\frac{1}{2}[(2 \log_2 a + \log_2 b) - 5 \log_2 c]$ as a single logarithm.

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

$\sqrt{2}$ is in the interval $(0, 2)$.

true

☐

false

☐

$\exists n \in \mathbb{Z}$, such that $n^2 = 1$.

true

☐

false

☐

undefined

☐

If $\sqrt{2}$ is rational, then -3 is positive.

true

☐

false

☐

undefined

☐

For integer x ,
 $2 \lfloor x \rfloor = \lfloor 2x \rfloor$

true

☐

false

☐

$\sqrt{2} \in \mathbb{R}$

true

☐

false

☐

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1. (5 points) Solve $-15 = -8 \log_2(2x) + 7$ for x .

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

$0 \in \mathbb{Z}$

true

☐

false

☐

$\lfloor -3.4 \rfloor$

-3

☐

3.4

☐

-4

☐

undefined

☐

For any real number x ,
 $\lceil \lfloor x \rfloor \rceil = \lfloor x \rfloor$.

true

☐

false

☐

$\exists n \in \mathbb{R}$, such that $n^2 = 10$.

true

☐

false

☐

undefined

☐

For all positive integers n ,
 if $n! < 10$, then $n < 100$.

true

☐

false

☐

undefined

☐

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1. (5 points) $\log_4 \frac{16^2}{2^{-3}} =$

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

$$p \rightarrow q \equiv q \rightarrow p$$

true

☐

false

☐

$$\text{If } \pi > 7, \text{ then } 3 < 1$$

true

☐

false

☐

undefined

☐

$$\sqrt{2} \in \mathbb{R}$$

true

☐

false

☐

$$0 \in \mathbb{R}$$

true

☐

false

☐

$$\text{For any real number } x, \lfloor x \rfloor \leq \lceil x \rceil.$$

true

☐

false

☐

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1. (5 points) $\log_2\left(\frac{\sqrt[3]{16}}{8}\right) =$

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

$$p \rightarrow q \equiv \neg p \rightarrow \neg q$$

true

☐

false

☐

For any real number x ,
if $x > 10$, then $x^2 > 0$.

true

☐

false

☐

undefined

☐

For any integer x , $\lfloor x \rfloor = x$.

true

☐

false

☐

$$5 \in \mathbb{Q}$$

true

☐

false

☐

7 is a real number

true

☐

false

☐