

Name: _____

NetID: _____ Lecture: A B

Discussion: Thursday Friday 10 11 12 1 2 3 4 5 6

1. (5 points) $\frac{\log_3(81^n)}{\log_3 \frac{1}{27}} =$

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

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

true ☐ false ☐ undefined ☐

2 is in the interval $(0, 2)$.

true ☐ false ☐

$\log_5 7 < 1$

true ☐ false ☐

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

true ☐ false ☐ undefined ☐

$\log_7 1$

0 ☐ 1 ☐ 7 ☐ undefined ☐

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1. (5 points) $4^{\log_2(7n)} =$

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

 $\frac{3}{7}$ is a real number

true

☐

false

☐

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

true

☐

false

☐

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

true

☐

false

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

true

☐

false

☐ $\forall x \in \mathbb{R},$
if $x^2 > 100$, then $|x| \geq 10$.

true

☐

false

☐

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1. (5 points) $x - \frac{x^2 - 2}{x - \sqrt{2}} =$

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

$-5 \in \mathbb{N}$

true ☐ false ☐

$0!$

0 ☐ 1 ☐ -1 ☐ undefined ☐

$a^{b^c} = (a^b)^c$

true ☐ false ☐

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

true ☐ false ☐ depends on q ☐

For any real number x ,
if $x \in \mathbb{N}$, then $x \in \mathbb{Q}$.

true ☐ false ☐

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1. (5 points) $25 \times 2^{-3 \log_2(5)} =$

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

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

true

☐

false

☐

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

true

☐

false

☐ $\lfloor -3.4 \rfloor$

-3

☐

3.4

☐

-4

☐

undefined

☐ $0 \in \mathbb{N}$

true

☐

false

☐

$$3^{\lfloor -1.5 \rfloor} =$$

-3

☐ $\frac{1}{9}$ ☐ $\frac{1}{3\sqrt{3}}$ ☐ $\frac{1}{3}$ ☐

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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.

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

true

☐

false

☐

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

true

☐

false

☐

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

true

☐

false

☐

$$0 \in \mathbb{Z}^+$$

true

☐

false

☐

7 is a real number

true

☐

false

☐

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1. (5 points) $\frac{(-1)^{k+2}2^{2k}}{(-2)^{k+1}} =$

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

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

true ☐ false ☐ undefined ☐

$\pi < 7$ or $\frac{3}{4} > \frac{2}{3}$

true ☐ false ☐

If 7 is even, then 7 is a perfect square.

true ☐ false ☐ undefined ☐

$-5 \in \mathbb{Z}$

true ☐ false ☐

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

true ☐ false ☐