Your TA: _____   Seat #: ☐ – ☐

Math 105 TOPICS IN MATHEMATICS

QUIZ – III (In-Class)

February 13 (Fri), 2015

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  Line #: 52920.

ID # : _____   Name : _____

⋆   <u>**No calculator**</u> .

[I] (6pts)

(1) Which number is bigger, $\dfrac{1}{15}$,   or $\dfrac{1}{150}$?   _____ .

(2) Which number is bigger, $\dfrac{23}{24}$,   or $\dfrac{24}{25}$?   _____ .

(3) Which number is bigger, $\dfrac{98}{99} \cdot \dfrac{97}{99}$, or $\dfrac{99}{100} \cdot \dfrac{98}{100}$?   _____ .

[II] (6pts)   (1)   <u>True or false</u> :

  <u>If</u> $\boxed{a \ < \ b}$ <u>and moreover a is positive, then</u> $\boxed{\dfrac{1}{a} \ < \ \dfrac{1}{b}}$.

        ☐   True.   ☐   False. $\left(\underline{\text{Check one.}}\right)$

(2)   <u>True or false</u> :

    <u>If</u> $\boxed{a < b}$ <u>and</u> $\boxed{c < d}$ <u>then</u> $\boxed{a\,c \ < \ b\,d}$.

        ☐   True.   ☐   False. $\left(\underline{\text{Check one.}}\right)$

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ID # : _____   Name : _____

[III] (3pts)   Agree

$$\binom{5}{3} \cdot \left(\frac{1}{5}\right)^3 \;=\; \frac{1}{1 \cdot 2 \cdot 3} \;\cdot\; \frac{5}{5} \cdot \frac{4}{5} \cdot \frac{3}{5}.$$

Write each of the following quantity in the similar way.

$$\binom{9}{4} \cdot \left(\frac{1}{9}\right)^4 \;=\; \frac{1}{\boxed{1} \cdot \boxed{} \cdot \boxed{} \cdot \boxed{}} \cdot \frac{\boxed{9}}{\boxed{9}} \cdot \frac{\boxed{}}{\boxed{9}} \cdot \frac{\boxed{}}{\boxed{9}} \cdot \frac{\boxed{}}{\boxed{9}}.$$

$$\binom{40}{3} \cdot \left(\frac{1}{40}\right)^3 \;=\; \frac{1}{\boxed{1} \cdot \boxed{} \cdot \boxed{}} \cdot \frac{\boxed{40}}{\boxed{40}} \cdot \frac{\boxed{}}{\boxed{40}} \cdot \frac{\boxed{}}{\boxed{40}}.$$

[IV] (5pts)   Which number among the following (a), (b) and (c) is the biggest?

(a) $\left(1+\dfrac{1}{10^5}\right)^{10^5}$,   (b) $\left(1+\dfrac{1}{10^{10}}\right)^{10^{10}}$,   or   (c) $\left(1+\dfrac{1}{10^{15}}\right)^{10^{15}}$.

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