Math 105  TOPICS IN MATHEMATICS

QUIZ – III (In-Class)

February 13 (Fri), 2015

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* No calculator .

[I] (6pts)

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

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

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

[II] (6pts) (1) True or false :

If $a < b$ and moreover $a$ is positive, then $\frac{1}{a} < \frac{1}{b}$ .

☐ True. ☐ False. (Check one.)

(2) True or false :

If $a < b$ and $c < d$ then $ac < bd$ .

☐ True. ☐ False. (Check one.)
[III] (3pts) Agree

\[
\left( \frac{5}{3} \right) \cdot \left( \frac{1}{5} \right)^3 = \frac{1}{1 \cdot 2 \cdot 3} \cdot \frac{5}{5} \cdot \frac{4}{5} \cdot \frac{3}{5}.
\]

Write each of the following quantity in the similar way.

\[
\left( \frac{9}{4} \right) \cdot \left( \frac{1}{9} \right)^4 = \left( \frac{9}{9} \right) \cdot \left( \frac{9}{9} \right) \cdot \left( \frac{9}{9} \right) \cdot \left( \frac{9}{9} \right).
\]

\[
\left( \frac{40}{3} \right) \cdot \left( \frac{1}{40} \right)^3 = \left( \frac{40}{40} \right) \cdot \left( \frac{40}{40} \right) \cdot \left( \frac{40}{40} \right).
\]

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

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