

Math 105 TOPICS IN MATHEMATICS
REGULAR HOMEWORK – VI

February 20 (Fri), 2015

Instructor: Yasuyuki Kachi

Line #: 52920.

★ **Due date:** Wednesday, February 25th, 2015 .

★ **Your paper will be collected in class. No late homework will be accepted.**

Please see “Rules, Policies and Protocols” p.14 about homework policy.

[I] (6pts) Simplify: (1) $3 \cdot x \cdot 5$. (2) $35 \cdot x^4 \cdot 2^3$.

[II] (3pts) Substitute $a = -8$ in $(x+a)^4$. Write out the result.

[III] (6pts) (1) $1 - \frac{1}{10} = ?$

(2) Complete the formula: $\frac{1}{a} \cdot \frac{1}{b} \cdot \frac{1}{c} \cdot \frac{1}{d} = \frac{1}{\boxed{}}$.

[IV] (9pts) (1) True or false :

If $\boxed{a < b}$ and $\boxed{t > 0}$ then $\boxed{ta < tb}$.

(2) True or false : If $\boxed{c > d}$ then $\boxed{1 - c > 1 - d}$.

(3) Which number is bigger, $\frac{9}{9} \cdot \frac{8}{9} \cdot \frac{7}{9} \cdot \frac{6}{9}$ or $\frac{10}{10} \cdot \frac{9}{10} \cdot \frac{8}{10} \cdot \frac{7}{10}$?

[V] (6pts) (1) $\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} + \frac{1}{32} + \frac{1}{64} = 1 - \frac{1}{\boxed{}}$.

(2) Let n be a positive integer. Then

$$\frac{1}{2^1} + \frac{1}{2^2} + \frac{1}{2^3} + \frac{1}{2^4} + \cdots + \frac{1}{2^n} = 1 - \frac{1}{2^{\boxed{}}}$$