



Q DGGLWLRQ WR VFRULQJZKWWGHIQWD UHRSRVLWRQ/ LEV
FRQVLGHUDWLRQZHUHQFH JLYPSOLFLW\ RULJLQDOI

Calculators are NOT permi

7KH HTXDWR@UHSUHVHQWV D SDUDERODPRU DOO U

$$L f x \frac{x}{x} DQG f_n L f f_n x$$

nIRU « &RPSXWH ZLWK SURRI

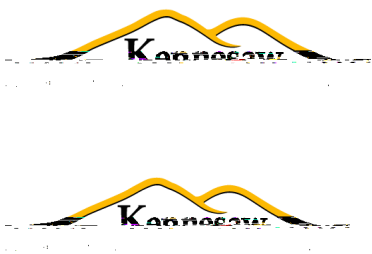
&RQVLGHU WKH WKUHHDOXP EHUWKHUH D SRVLWLYH LC

D)LQG ZLWK SURRIIDZLYFOXOH WKUHH QXPEHUV D

E3URYH WKDW WKHUH DUHROIZQLWIKORRORRYVOMHW
LV D SULPH QXPEHU

WKH FRUUHFW URRP NH\

,Q WKH ILJXUH \$%&' LV D V\$XDUH 0 LV WKH PLGSRI
DQG 1 LV WKH%PLGSRQWQHUVHFW DW



THE 2012-2013 KENNESAW STATE UNIVERSITY
HIGH SCHOOL MATHEMATICS COMPETITION
PART II



SOLUTIONS

D ~~HWVRVKRWKDWKHUHLVRLQ y KLKSDVHVWKURKDOSDBROD~~
~~ZWKHTWLRQRIWKHIRUR~~ $\sum_{k=0}^n \binom{n}{k} a^k$ ~~HW mQ n~~

\emptyset

$$x^{-1} - R \quad y^{-1} -$$

E ~~Q~~ $y^{-1} x^{\& \sum} \& ax \sum a$
~~Q~~ $y^{-1} x \sum ax \sum a \sum a! a^{-1} x \sum a \sum a! a$
~~Q~~ $! a a! a$
 $y^{-1} f \sum 1! x^{\& !} x$

~~Q~~

$$f(x) = \frac{x!}{x^{\sum}} \quad f(x) = f(x) = f(x) = \frac{\sum x! \sum}{\sum x^{\sum} \sum} = \frac{x!}{x}$$

$$f(x) = f(x) = f(x) = \frac{\sum x! \sum}{\sum x^{\sum} \sum} = \frac{x!}{x!} \quad f(x) = \frac{x^{\sum}}{!x} \quad f(x) = \frac{x^{\sum}}{!x}$$

$$f(x) = x \quad f(x) = \frac{x!}{x^{\sum}} \quad f_{*n} \sum 1 x$$

$$f \quad 1f \quad 1 \frac{!}{!} 1$$

« 7 A 6 ' 1 5 B 6 U 1'

Ub X « AaD B ' 1 5 d 7 ' 1' " ' ' l g] b [' e i U X f] ` Uh Y f U ` ' 6 A D B
' 1' E & U "\$'

G] b ' 1' g U b fl & g \$ b U E + W d W c & U 1 \$ E g W d b g &

K] h \ c i h ' ` c g g ' c Z ' [Y b Y f U `] h m ž ' ` Y h ' 7 6 ' 1' & ž ' g c
Ub X ' 7 A) "' 1'

l g] b [8 A f 6] 7 [ž \ U h g & b ' ' H \ Y f Y Z c f Y ž ' i g] b [' h \ Y ' ')

U d d f c d f] Uh Y ' X c i V ` U Y ' ' U b [' & y] E ' & A c f G a i ! ') " U ž ' ' W c g &

U' 1 ' % H \ Y f Y Z c f Y ' g] b ' 1'

G] b W A Y U b X B U f Y ' a Y X] Ub g ' c Z ' h f] Ub [` Y ' 5 6 7 ž ' d c] b h
c Z ' h \ Y ' h f] Ub [` Y ž ' g c) U \ Uh ' 5 D ' 1' 7 D ' 1' ' 7 A ' ' 1'