HIGH SCHOOL MATHEMATICS COMPETITION

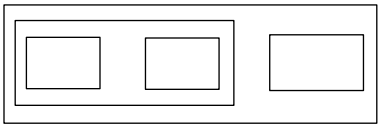
3$57 ,0 8/7,3/(&+2,&(

For each of the following 25 questions, carefully blacken the appropriate box on the answer sheet with a #2 pencil. Do not fold, bend, or write stray marks on either side of the answer sheet. Each correct answer is worth 6 points. Two points are given if no box, or more than one box, is marked. Zero points are given for an incorrect answer. Note that wild guessing is likely to lower your score. When the exam is over, give your answer sheet to your proctor. You may keep your copy of the questions.

NO CALCULATORS

90 MINUTES

6XSSRVH WKDW IRU HDFK [Q QHJDWLYH LQWHJHU [WKH VXP RI WKH YDOXH RI



(A) 3 (B) 5 (C) 9 (D) 15 (E) 25

2. 7RP WUHDWHG KLV EHVW IULHQG WR D ULGH LQ KLV QHZ DQG WKHLU GRJ EDFN KRPH ,I WKH FDU DYHUDJHG P DW WKH UDWH RI PLOHV SHU KRXU PDQ\ PLOHV G DLWHU WKH\ VWDUWHG" $VVXPH WKH\ WRRN WKH VDPH

(A) 9.5 (B) 12 (C) 15 (D) 18.5 (E) 22.5

/HW a b c a, b DQG c UH DUUDQJHG IURP VPDOOHVW W ZKLFK RI WKH IROORZLQJ LV FRUUHFW"

$ a b c %

– (–

6XQ	0R	7X	:H	7K	)U	6D

<RX FXW D [VTXDUH IURP WKH SDJH RI D FDOHQGDU VTXDUHV FRQWDLQ D GDWH DQG WKH VXP RI WKH GDW RI :KDW QXPEHU LV LQ WKH ORZHU OHIW FRUQHU RI

$ % & ' (_____

7KH SRVLWLYH RGG LQWHJHUV DUH JURXSHG LQWR VHV

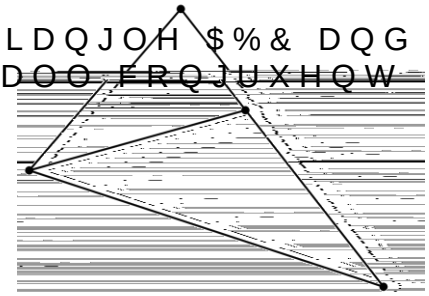
6HW ^` 6HW ^

8.

$,I ZH PDNH D WDEOH RI RXWFRPHV OLVWLQJ WKH SRVV
WKH OHIW WKH SRVVLEOH QXPEHUV RQ WKH VHFRQG V
LQ WKH WDEOH ZH REWDLQ

% 8VLQJ WKH /DZ RI 6LQHV RQ WULDQJOH $%& DQG QRWL
DQJOHV %$' '$& DQG $&% DUH DOO FRQJUXHQW

Ÿ VLQ Ÿ
VLQ



% &RQVLGHU WKH GLDJUDP DW WKH ULJKW ZKHUH WKH W
FLUFOHV UHSUHVHQW WKH VWXGHQWV ZKR OLNH 3RWL
+HUERO RJ DQG 'HIHQVH $JDLQVW WKH 'DUN $UWV
:H KDYH XVHG WKUHH VROLG FLUFOHV WR UHSUHVHQW WKH
YDULRXV VHWV RI WKH VWXGHQWV ZKR OLNH GLIIHUHQW
FRPELQDWLRQV RI VXEMHFWV :H DUH LQWHUHVWHG LQ
RQH :H NQRZ WKDW RI WKH IULHQGV RU VWXGHQ
OLNH DW OHDVW RQH RI WKHVH VXEMHFWV
LQIRUPDWLRQ LQ WKH SUREOHP ZH FDQ FRQFOXGH WKD

a b c d e f g
b c e f
a b d e
d e f g
b e
e d
e

$GGLQJ WKH VHFRQG WKLUG DQG IRXUWK HTXDWLRQV
d e f ZKLOH DGGLQJ WKH ODVW WKUHH HTXDWLRQV
b d e f &RPELQLQJ WKHVH ZLWK HTXDWLRQ YDOXH
b c d f DQG

Q GRƒ FC™C€Q E„ÂÓRv 6A/U“9x} Æ•R ¤É`u€À9%•ÉD„„ 0ñ@3E¤R@0 #d õYƒ9x}D

$ 0HWKRG 7KH VORSH RI D OLQH LV WKH WDQJHQW RI
x D[LV 7KHUHIRUH W'DQ'Q DQG'%W kWDQ

1RWLQJ$W3#DW23

WDQ23 W%2Q3 W$2Q± 32'
'AWDD QW DPQD
'AWDD QW DPQD

7KHQ '3W'DQ W'%Q2'' %23

' OP k –
' %P k §·
© ¹

7KHUHIRUH à