

ML<?J@>: X  
AZ \_kl bl \_ev ^bj \_dl hj Z  
i h nq [ gh f \_l h^bq\_kdhc j Z hl \_  
BBBBBBBBB> : F Z Z Z h\Z  
©BBB<sup>a</sup> BBBBBBBBBBB ]

NHG> HP?GHQGU OKJ?>KL<  
MQ?; GHC >BKPBI EBGU

HM> F Z \_f Z bdZ

Ki \_pbZevghkl v

©L nj baf b ]hkl \_j j bbf kl \ h<sup>a</sup>

D\ ZebnbdZpby- Ki \_pbZebkl i h l nj baf mb ]hkl \_j j bbf kl \ m

F ZoZqdZeZ+2023

NHG> HP?GHQGUO KJ?>KL< mq\_[ghc ^bkpbZiekgu\jZMjZ[hjZeg  
]hkm^Zjkl\\_ggh]h h[jZah\ZI\_evgh]h Nk+Zig^ZjhZ ki^ZpZevghklb kj\_^g  
h[jZah\Zgby b j\_dhf\_g^h\ZgZ ^ey j\_ZebaZpbb hkgh\ghc ijhn\_  
ijh]jZffu KIH ih ki\_pbZevghklb ©Lmjba f b ]hkl\_ijbbfkl\h^a

JZkkfhlj\_ggZ aZk\_^ZgZp]bq\_kdh]h kh\\_IZ IHQM ©=ID^a  
ljhlhdhe h29.08.2023]h^Z

JZajZ[hIqbd[Z^ZghFZij:\_ih^Z\ZIIHQM#ID

Kh^\_j`Zgb\_

- 1 IZkihjd h fie \_ dhpZ\_ ghq gju\_σ^kl\
  - 1.1 H[eZ kiljbf\_g\_gdhyfie \_ dhpZ\_ ghq gju\_σ^kl\
  - 1.2 I\_j\_q\_gvamevlZlh\
- 2. J\_a mevlhZ\h \_ gby\_[ghj]h^f\_lZh^e\_`Zsi ph\ \_jd\_
- 3. Nhgkp\_ghqguo\_kj\_^kl\
  - 2.1 L\_dmsdrcgljhaki\_\Z\_fhklb
  - 2.2 Ijhf\_`mlhqgZy\_klZpby

1 IZkihjd h f i e \_ d h z \_ g h q g u o ^ k l \

1.1 H[eZkljbf\_g\_g d h f i e \_ d h z \_ g h q g u o ^ k l \

D h f i e \_ d h z \_ g h q g u o ^ k l \ \_ ^ g Z a g Z e y d h g l j h e y h p \_ g d h j Z a h \ Z I \_ e v g u  
^ h k l b ` \_ g h [ m q Z x s b f b k y h b \ r b j o ] j Z f f m q \_ [ g h j ] h ^ f \_ l o F Z I \_ f Z I b k d Z ^ a g \_ ] h  
i j h n \_ k k b h g Z e v j Z a h \ Z g b y ^ \ e b H I K H H

N h g h p \_ g h q g u o ^ k l j Z a j Z [ h \ Z g h h l \ \_ l k l k l b \_ [ h \ Z g b y d f j b \_ a m e v l Z I Z f  
n \_ ^ \_ j Z e v g h ] h ] h k m ^ Z j k l \ \_ g g h ] h h [ j Z a h \ Z I \_ e v g h ] h k l Z g ^ Z j l Z k j  
N = H K H H m l \ \_ j ` ^ \_ g g h ] h i j b d Z a h f F b g b k l \_ j k l \ Z h [ j Z a h \ Z g b y b  
] 1 N ^ \_ j Z e v g h c h [ j Z a h \ Z I \_ e v g h c i j h ] j Z f f u k j \_ ^ g \_ ] h h [ s \_ ] h  
F b g b k l \_ j k l } k \ \_ s \_ g b N h l 18 f Z y 2023 ] N 371) b N = H K k i \_ p b Z e v g i h k l b  
k i \_ p b Z e v g h k l b © L m j b a f b ] h k l \_ i j m b a f k [ g h h e z g l z j Z [ h q i j h ] j Z f f u  
m q \_ [ g h j ] h ^ f \_ l z M . 05.  
© F Z I \_ f Z I b d Z ^ a

M q \_ [ g u j c ^ f \_ l k h h l \ \_ l k l k l b \_ [ g u e f Z g h b a m q Z g Z k y j \ h f d m j k l h  
l h j h k \_ f \_ k l a z \ \_ j r Z \_ w k d y a Z f \_ g h f

N h g h d e x q Z \_ k \_ [ d h g l j h e v g h g h q g u o ^ k l \_ j b Z e h a \ h e y x s h p \_ g b l v  
m j h \ \_ g h k l b ` \_ g b a m e v l Z I h \

1.2 I \_ j \_ q \_ g v a m e v l Z I h \

H k \ h \_ g b \_ k h ^ \_ j ` Z g b y h [ s \_ h [ j Z a h \ Z I \_ e v g h c \_ k i b k p b Z e b g u h k l b  
h [ m q Z x s b f b k y k e \_ ^ m x s b o j \_ a m e v l Z I h \

e b q g h k l g u o \ d e x q Z x s b o  
h k h a g Z g b \_ h [ m q Z x s b f b k y j h k k b c k d h c ] j Z ` ^ Z g k d h c b ^ \_ g l b q g h k l  
] h l h \ g h k k v f h j Z a \ b l b x k Z f h k l h y l \_ e v g h k l b b k Z f h h i j \_ ^ \_ e \_ g b x  
g Z e b q b \_ f h l b \ Z p b b d h [ m q \_ g b x b e b q g h k l g h f m j Z a \ b l b x

p \_ e \_ g Z i j Z \ e \_ g g h \_ j Z a \ b l b \_ \ g m l j \_ g g \_ c i h a b p b b e b g j z h k l l b g g Z i  
p \_ g g h k l \_ c g Z j h ^ h \ J h k k b c k d h c N \_ ^ \_ j Z p b b b k l m j e q l r k d o o b l j z z k  
n h j f b j h \ Z g b \_ k b k l \_ f u a g Z q b f u k o f u k e h g u o k l g h k l Z g h \ h d Z g l b d h j j  
f b j h \ h a a j \_ g b y i j Z \ h k h a g Z g b y w d h e h ] b q \_ k d h c d m e v l m j u k i h k l  
` b a g \_ g g u \_ i e Z g u

f \_ l Z i j \_ ^ f \_ l g u o \ d e x q Z x s b o  
h k \ h \_ g g u \_ h [ m b k Z x s b f ` i j \_ ^ f \_ l g u \_ i h g y l b y b m g b \ \_ j k Z e v g u \_  
j \_ ] m e y l b \ g u \_ i h a g Z \ Z I \_ e v g u \_ d h f f m g b d Z I b \ g u \_

k i h k h [ g h k l v b o b k i h e v a h \ Z g b y \ i h a g Z \ Z I \_ e v g h c b k h p b Z e v  
k Z f h k l h y l \_ e v g h f m i e Z g b j h \ Z g b x b h k m s \_ k l \ e \_ g b x h j h Z g h g a Z p b b y m c  
k h l j m ^ g b q \_ k l \ Z k i \_ ^ Z ] h ] b q \_ k d b f b j Z [ h l g b d Z f b b k \ \_ j k l g b d Z f b  
b g ^ b \ b ^ m Z e v g h c h [ j Z a h \ Z I \_ e v g h c l j Z \_ d l h j b b

h \ e Z ^ \_ g b \_ g Z \ u d Z b k k r e q ^ h g Z I \_ e v k d h c i j h \_ d l g h c b k h p b Z e v g h c  
i j \_ ^ f \_ l g u o \ d e x q Z x s b o \ h \_ g b \_ h [ m q Z x s b f b k y \ o h ^ \_ b a m q \_ g b y m q  
a g Z g b c m f \_ g b c b k i h k h [ h \ ^ \_ c k l \ b c k i \_ p b n b q \_ k d b o ^ e y k h h l \ \_ l k l \

H k h [ h \_ a g Z q \_ g b \_ ^ b k p b i e b g Z b f \_ \_ l i j b n h j f b j h \ Z g b b b j Z a \ b l b  
H D H D H D

2. J \_ a m e v l Z k l h \_ g r b g \_ [ g h j ] h ^ f \_ l Z h ^ e \_ ` Z s i t j h \ \_ j d \_

D h g l j h e v b h p \_ g m z e v l Z I h \ h k \ h \_ g b y h [ s \_ h [ j Z a h \ Z I \_ e v g h c ^ b k p  
q \_ j \_ a ^ b k p b i e b g Z j g u \_ j \_ a m e v l Z I u g Z i j Z \ e \_ g g u \_ g Z h m h k j k b j h g Z e v g  
d h f i \_ l \_ g p b c i h j Z a ^ \_ e Z f b l \_ f Z f k h ^ \_ j ` Z g b y m q \_ [ g h ] h f Z I \_ j b Z e Z

H[sZy ijhn_kkbhg dhfi_l_gpby	JZa^_e L_fZ	Lbi hp_ghqguo f_jhijbylbylbc
HD <u[bjZlv kihkh[u j_r_gby ijhn_kkbhgZevgh ^_yl_evghklb ijbfgbl_evgh d jZaebqguf dhgl_dklZf	J L_fZ -h <sup>5</sup> k 1.4, J L_fu 2.5, -lh k J L_fu 3.5, 3.6 J L_fu 4.5, -hl k 4.10 J L_fu - h k J L_f <u>u</u> 6.2, 6.3, 6.4, 6.5, -hl k	L_klbjh\Zgb_ Mklguc hijhk FZI_fZl <b>q</b> _kdbc ^ Bg^b\b^mZevgZy kZfhklhyl_ev <b>g</b> Zy lj_^klZ\^e_gb_ j_amevlZlh\ ijZdl jZ[h AZsbIZ l\hj <b>q</b> _kdb AZsbIZ bg^b\b^m ijh_dlh\ DhgljhevgZy jZ[h <uiheg_g <u>g</u> ^Zgbc wdaZf_g_
HD Bkihevah\ kh\j_f_ggu_ kj_ ihbkdZ ZgZebaZ b bgl_j bgnhjfpbb b bgnhjfpbhggu_ l_ogheh]bb ^ey \uiheg_gby aZ^Z ijhn_kkbhgZevgh ^_yl_evghklb	J L_fZ -h k 1.4. J L_fu 3.5, 3.6 J L_fu -h lk J L_fu -h k l 7.3, 7.4	L_klbjh\Zgb_ Mklguc hijhk FZI_fZl <b>q</b> _kdbc ^ Bg^b\b^mZevgZy kZfhklhyl_ev <b>g</b> Zy lj_^klZ\^e_gb_ j_amevlZlh\ ijZdl jZ[h AZsbIZ l\hj <b>q</b> _kdb AZsbIZ bg^b\b^m ijh_dlh\ DhgljhevgZy jZ[h <uiheg_gb_ aZ^Z wdaZf_g_
HD leZgbjh\Z j_Zebah\u\Zlv kh[kl\_ggh_ ijhn_kkbhgZevgh ebqghklgh_jZa\ ij_^ijbgbfZI_evk ^_yl_evghklv \ ijhn_kkbhgZevgh bkihevah\Zlv ag nbgZgkh]jZ <hlghkl </hlghkl  jZaebqguo `ba kbImZpbyo	J L_fZ -h k 1.4, J L_fu 2.5, -lh k J L_fu J L_fu 4.4, 4.5, -hl k 4.10 J [ L_fu 6.5, 6.6, -lh k J L_fu -h k l 3.5, 7.3, 7.4	L_klbjh\Zgb_ Mklguc hijhk FZI_fZl <b>q</b> _kdbc ^ Bg^b\b^mZevgZy kZfhklhyl_ev <b>g</b> Zy lj_^klZ\^e_gb_ j_amevlZlh\ ijZdl jZ[h AZsbIZ l\hj <b>q</b> _kdb AZsbIZ bg^b\b^m ijh_dlh\ DhgljhevgZy jZ[h <uiheg_gb_ aZ^Z wdaZf_g_
HD Wnn_dlb\ \aZbfh^_ckl\h\Zl jZ[hIZlv \ dhee_ dhfZg^_	J L_fZ -h k 1.4, J L_fu 2.5, -lh k	L_klbjh\Zgb_ Mklguc hijhk FZI_fZl <b>q</b> _kdbc ^ Bg^b\b^mZevgZy kZfhklhyl_ev <b>g</b> Zy lj_^klZ\^e_gb_

	<p>J L_fu 3.5, 3.6 J L_fu 4.5, 4.6, 4.7 -h k 4.10 J L_fu -h k 5.4, 5.5, 5.6</p>	<p>j_amevlZlh\ ijZdl jZ[h] AZsbIZ \hj_q_kdb AZsbIZ bg^b\b^m ijh_dlh\ DhgljhevgZy jZ[h] &lt;uiheg_gb_ aZ^Z wdaZf_g_</p>
<p>HD Hkms_kl\e mklgmxb ibkvf_ dhffmgbdZpbx gz ]hkm^Zjkl\_gghf Jhkkbckdhc N_ mq_lhf hkh[_ggh khpZevgh]h b dmevlmjgh]h dhg</p>	<p>J L_fZ -h k 1.4, J L_3fu 3.2, 3.3, 3.4, 3.5, 3.6 J [ L_fu [ ] 6.5, [ [ -hlk J L_fu -h k l 7.3, 7.4</p>	<p>L_klbjh\Zgb_ Mklguc hijhk FZI_fZlbq_kdbc ^ Bg^b\b^mZevgZy kZfhklhyl_evgZy lj_^klZ\^e_gb_ j_amevlZlh\ ijZdl jZ[h] AZsbIZhj_q_kdb o j AZsbIZ bg^b\b^m ijh_dlh\ DhgljhevgZy jZ[h &lt;uiheg_gb_ aZ^Z wdaZf_g_</p>
<p>HDH Ijhy\eylv ]jZ`^Zg-kdh iZljbhIbq_kdmx ihabpbx ^_fhgkljbjh\Zlv hkhagZggh_ ih\_^_gb_ gZ hkl ljZ^bpbhgguo h[s_q_eh\_q_kdb p_gghkl_c \lf mq_lhf ]ZjfhgbaZ f`gZpbhgZevguo f`j_eb]bhaguo hlghr_gbc ijbf_g klZg^Zjlu Zglbdhjjmipbhgg ih\_^_gby</p>	<p>J L_fZ -h k 1.4. J L_fu 4.5, -hlk 4.10 J L_fu -h k 5.4, 5.5, 5.6</p>	<p>L_klbjh\Zgb_ Mklguc hijhk FZI_fZlbq_kdbc ^ Bg^b\b^mZevgZy kZfhklhyl_evgZy lj_^klZ\^e_gb_ j_amevlZlh\ ijZdl jZ[h] AZsbIZ \hj_q_kdb AZsbIZ bg^b\b^m ijh_dlh\ DhgljhevgZy jZ[h &lt;uiheg_gb_ aZ^Z wdaZf_g_</p>
<p>HD Kh^_dkl\h khozZg_gbx hdjm kj_^u j_kmjkhk[_j`_gb ijbf_gylv agZgby baf_g_gbb debfZ ijbgpbui [_j`_eb\ ijhba\h^kl\Z wnn_dlb\gh ^_ck qj_a\uqZcguo kb</p>	<p>J L_fu 2.5, -lh k J L_fu 4.5, 4.6, -lh k 4.10 J L_fu -h k 5.4, 5.5, 5.6 J L_fu 6.5, -hlk</p>	<p>L_klbjh\Zgb_ Mklguc hijhk FZI_fZlbq_kdbc ^ Bg^b\b^mZevgZy kZfhklhyl_evgZy lj_^klZ\^e_gb_ j_amevlZlh\ ijZdl jZ[h] AZsbIZ \hj_q_kdb AZsbIZ bg^b\b^m ijh_dlh\ DhgljhevgZy jZ[h &lt;uiheg_gb_ aZ^Z wdaZf_g_</p>

## 3. Nhg^ hp\_ghqgu o kj\_^kl \

## 3.1 L\_dms bc dhgl j hev

nki \\_Z\_f hkl b<oh^ghc dhgl j hev agZgbc

P\_ev i j h \\_j dZ agZgbc b i j ZdI bq\_kdbo nf \_gbc h[ mZx s boky i h Ze] \\_j \_az9 deZkk  
<Z bZgl 1

< 1. <ui hegbl v^\_ckl \by

$$\left( \begin{array}{c} \text{A} \\ \text{.} \end{array} \right)$$

< 2. J\_r bl v mj Zg\_gb\_:

$$\begin{array}{l} Z 4 \pm o 2,5) = o 9,5 \\ [ \delta + o + 2 = 0 \end{array}$$

< J\_r bl v kbkl\_f m

$$\begin{array}{l} mj Zg_gbc Z o m \\ = 1 \end{array}$$

$$\begin{array}{l} o m 0 \\ [ \delta \pm m - 1 \\ o + m - 1 \end{array} \left. \begin{array}{l} \} \\ \} \end{array} \right\}$$

< 4. J\_r bl v kbkl\_f mg\_j Z\_gkl \:

$$\begin{array}{l} o \pm 1 \cdot 0 \\ 15 \pm o \cdot 0 \end{array} \left\{ \right.$$

< 5. J\_r bl v g\_j Z\_gkl \h

$$\delta \pm o \pm 1 " 0$$

< 6. I hkl j hbl v ]j Zhbd nmgdpbb

$$m - \delta + o \pm 5$$

< 7. J\_r bl v az^Zqm: g^j\_c kl Z\_r \_He\_]ZgZ4 ]h^Z ZHe\_] kl Z\_r \_; hj bkZ\1,5 j ZaZ  
<f\_kl\_bf 36 e\_l Kdhevde\_l dZ ^hf mbagbo?

< 8. GZcl b knf f nm i\_j \u o qe\_gh \ Z bnf \_l bq\_kdhc i j h]j\_kkbb6, 3, 0, -3, « , \_keb  
n = 14.

<Z bZgl 2

< 1. <ui hegbl v^\_ckl\by

$$\hat{A} \left( \begin{matrix} \\ \\ \end{matrix} \right)$$

< 2. J\_r bl v mj Z\_g\_gb\_:

$$Z \quad o_{\pm 5,5} = o_{\pm} \quad o_{\pm 1,5}$$

$$[ \quad 5 \delta - \quad o - 4 = 0$$

< J\_r bl v kbkl\_f mj Z\_g\_gbc

$$Z \quad \begin{cases} 4 o - m - 1 \\ o - m - 4 \end{cases}$$

$$[ \quad \begin{cases} \delta \pm m \neq 5 \\ o \neq m - 4 \end{cases}$$

< J\_r bl v kbkl\_f mg\_j Z\_gkl\

$$4 o + 2 = 0$$

$$7 \pm o = 0$$

}

< 5. J\_r bl v g\_j Z\_gkl\h

$$\delta + o_{\pm 3} = 0$$

< 6. l hkl j hbl v j j Zhbd n mg dpbb

$$m - \delta - o = 3$$

< 7. J\_r bl v aZ^Zqm <h\Zkl Z\_r \_: j l z f ZgZ3 j h^Z Z: j l z f kl Z\_r \_: e\_dk\_y\2 j ZaZ  
<f\_kl\_bf 33 j h^Z Kdhevde\_l dZ ^hf mbagbo?

< 8. GZcl b krf f m i \_j \ u o qe\_gh\ Z bnf \_l bq\_kdhc i j h j \_kkbb16, 13, 10, 7, « , \_keb  
n = 11.

Dj bl \_j bb hp\_gdb dhgl j hevghc j Z hl u

AZ^Zgby	; Zeeu	l j bf _qZgb_
1-8	8	DZ ^uc i j Z bevguc hl \ _ 1 [ Zee

F Zdkbf Zevguc [ Zee aZj Z hl m±10 [ Zeeh\

R dZeZi \_j \_h^Z [ Zeeh\ \ hl f \_l db

Hl f _l dZ	Qbkeh [ Zeeh\ g_h [ oh^bf h_^ey i henq_gby hl f _l db
© <sup>a</sup> hl ebqgh	8
© <sup>a</sup> ohj hr h	7-6
© <sup>a</sup> m^h\ e_l \ hj bl _evgh	5 - 4
© © g_m^h\ e_l \ hj bl _evgh	f_g_4



<u qbke\_gb\_agZq\_gbc \ u j Z\_gbc Mj Z\_g\_gby b g\_j Z\_gkl \ Z  
 P\_ev i j h \ j dZ agZgbc b i j Zdl bq\_kdbo m\_i\_gbc h[ m\_qZx s boky

1 \ Z bZgl

$$: <u qbkebl \_ \frac{0,725 + 0,6 + \frac{7}{40} + \frac{11}{20}}{0,128 \frac{1}{6} - 0,0345: \frac{3}{25}} 0,25.$$

: J\_r bl v m\_j Z\_g\_gby

1)  $2x^2 + 5x - 1 = 0$ ;    2)  $3x^2 = x$ ;    3)  $\frac{4x-1}{2} - \frac{3x+2}{4} = 1.$

< J\_r bl v g\_j Z\_gkl \ Z

1)  $4 - 2x - 1 - (4x - 1)$ ;    2)  $\frac{2x-1}{5-x} = 0.$

< J\_r bl v k\_bkl\_f m m\_j Z\_g\_gbc

$$\begin{matrix} 2x + 5y = 15 \\ x - 2y = 3 \end{matrix}$$

K J\_r bl \_ m\_j Z\_g\_gby

1)  $5(x-1)^2 = 3 - 4x + 5x^2$ ;    2)  $\sqrt{x+2} = x.$

2 \ Z bZgl

$$: <u qbkebl \_ \frac{0,425 + 0,9 + \frac{7}{40} + \frac{11}{20}}{0,5 \frac{1}{5} - 0,023: \frac{2}{25}} \frac{1}{4}.$$

: J\_r bl v m\_j Z\_g\_gby

1)  $4x^2 - 5x - 6 = 0$ ;    2)  $-3x^2 = x$ ;    3)  $\frac{4x-1}{3} - \frac{3x+2}{6} = 1;$

< J\_r bl v g\_j Z\_gkl \ Z

1)  $2(1 \pm 0 \cdot 0 \pm (3 \pm 2))$ ;    2)  $\frac{2x+1}{5-x} = 0.$

< J\_r bl v k\_bkl\_f m m\_j Z\_g\_gbc

$$\begin{matrix} x + 5y = 15 \\ 3x - 2y = -6 \end{matrix}$$

K J\_r bl \_ m\_j Z\_g\_gby

1)  $5(x+2)^2 = 4x + 5x^2$ ;    2)  $\sqrt{x-11} = x.$

Dj bl \_ j bb hp\_gdb dhgl j hevghc j Z hl u

AZ^Zgby	; Zeeu	I j bf_qZgb_
: ±:	4	DZ ^uc i j Z bevguc hl \ _ 1 [ Zee
< - <	6	DZ ^uc i j Z bevguc hl \ _ 2 [ ZeeZ

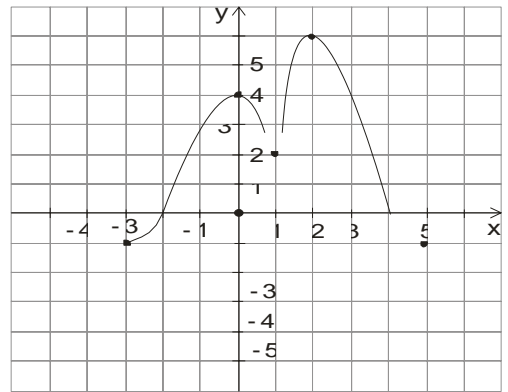
K	6	DZ ^uc i j Z bevguc hl \_l 3 [ ZeeZ
F Zdkbf Zevgu c [ Zee aZj Z hl m±16 [ Zeeh\		
R dZeZi _j _\h^Z[ Zeeh\ \ hl f _l db		
hl f _l dZ	Qbkeh [ Zeeh\ g_h[ oh^bf h_^ey i henq_gby hl f _l db	
© <sup>a</sup> hl ebqgh	16 - 15	
© <sup>a</sup> ohj hr h	14 - 13	
© <sup>a</sup> m^h\ e_l \ hj bl _evgh	12 - 9	
© © g_m^h\ e_l \ hj bl _evgh	f_g_9	

K\ hckl \ Zn mgdpbc b bo ]j Znbdb  
P\_ev i j h \\_j dZ agZgbc b i j Zdl bq\_kdbo mfi \_gbc h[ mZx s boky

1 \Z bZgl  
: DZhc ba]j Znbdb\ bah[j Z \_ggu oGZj bkmgdZo 1) ±4) aZ^Z\_l nmgdpbb

: ; < = 4).  
: GZc^bl \_h[ eZkl v hi j \_^\_e\_gby nmgdpbb y = √4x - 1  
: x > 2; ; x < 2; < [ •  $\frac{1}{4}$ ; = [ "2.

: I h ] j Z n b d m n n g d p b b y = f(x) n d Z b l \_  
 Z h [ e Z k l v h i j \_ ^ \_ e \_ g b y n n g d p b b  
 [ g n e b n n g d p b b  
 \ i j h f \_ ` n i d b i h k l h y g g h ] h a g Z d Z n n g d p b b  
 ] I h q d b f Z d k b f n i Z b f b g b f n i Z n n g d p b b  
 ^ i j h f \_ ` n i d b f h g h l h g g h k l b  
 \_ g Z b [ h e v r \_ \_ b g Z b f \_ g v r \_ \_ a g Z q \_ g b y  
 n n g d p b b  
 ` h [ e Z k l v a g Z q \_ g b c n n g d p b b  
 : K j \_ ^ b a Z ^ Z g g u o n n g d p b b c n d Z b l \_ q z l g u \_  
 1) n e 3; 2) m  $\sqrt{x}$ ; 3) m o  
 : b3); ; 1); <



< G Z c ^ b l \_ h [ e Z k l v h i j \_ ^ \_ e \_ g b y n n g d p b b n e  $\frac{2x + 1}{x(x - 1)}$ .

K I h k l j h c l \_ ] j Z n b d n n g d p b b  $y = x^2 \pm 4x + 3$  b n d Z b l \_ \_ k \ h c k l \ Z  
 \ Z j b Z g l

2

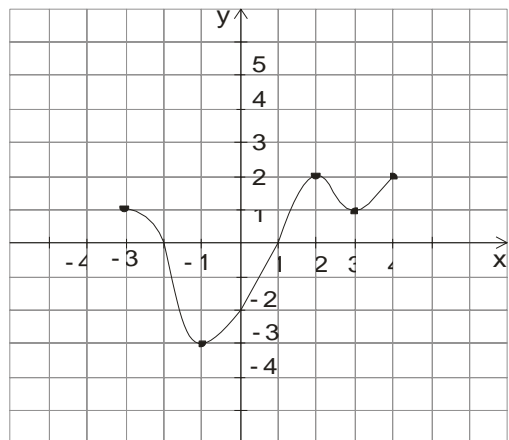
: D Z d h c b a ] j Z n b d h \ b a h [ j Z \_ g g u o g Z j b k n g d Z o 1)  $\pm 4$ ), a Z ^ Z l n n g d p b b x "

: 1). ; < 3). 1 =

: G Z c ^ b l \_ h [ e Z k l v h i j \_ ^ \_ e \_ g b y n n g d p b b  $y = \frac{1}{\sqrt{9 - 3x}}$

:  $x > 3$ ; ;  $x < < [ \bullet = [ < 1/3$ .

: I h ] j Z n b d m n n g d p b b y = f(x) n d Z b l \_  
 Z h [ e Z k l v h i j \_ ^ \_ e \_ g b y n n g d p b b  
 [ g n e b n n g d p b b  
 \ i j h f \_ ` n i d b i h k l h y g g h ] h a g Z d Z  
 n n g d p b b  
 ] I h q d b f Z d k b f n i Z b f b g b f n i Z  
 n n g d p b b  
 ^ i j h f \_ ` n i d b f h g h l h g g h k l b  
 \_ g Z b [ h e v r \_ \_ b g Z b f \_ g v r \_ \_  
 a g Z q \_ g b y n n g d p b b  
 ` h [ e Z k l v a g Z q \_ g b c n n g d p b b



: K j \_ ^ b a Z ^ Z g g u o n n g d p b b c n d Z b l \_ g \_ q l g u \_

1)  $m = 3$ ;      2)  $m = \frac{3}{x}$ ;      3)  $m = 0$   
 : 1)  $b < 3$ ;      ; 2) ;      <  $b < 3$ ;      = 3).

$< GZc^{\wedge}bl\_h[eZkl v hi j \_ \_ e\_gby nmgdpbb m = \frac{2+x^2}{x(x-5)}$

K I hkl j hcl \\_ j Znbd nmgdpbb  $y = x^2 \pm 2x + 1$  b mZ bl \\_ \\_ k\ hckl \ Z

Dj bl \\_ j bb hp\\_gdb dhgl j hevghc j Z hl u

AZ^Zgby	; Zeeu	I j bf\_qZgb\_
: ±:	10	DZ ^uc i j Z bevguc hl \_ 1 [ Zee
<	2	DZ ^uc i j Z bevguc hl \_ 2 [ ZeeZ
K	3	DZ ^uc i j Z bevguc hl \_ 3 [ ZeeZ

F Zdkbf Zevguc [ Zee aZj Z hl m±15 [ Zeeh\

R dZeZi \\_ \\_ h^Z [ Zeeh \\_ hl f \\_ db

Hl f \_ dZ	Obkeh [ Zeeh \_ g\_h [ oh^bf h\_ey i hemq\_gby hl f \_ db
© <sup>a</sup> hl ebqgh	15 - 14
© <sup>a</sup> ohj hr h	13 - 12
© <sup>a</sup> m^h\ e\_ \_ hj bl\_evgh	11 - 10
© © g\_m^h\ e\_ \_ hj bl\_evgh	f\_g\_10

HI \\_ \\_ u d aZ^Zgbyf

	1 < Z bZgl	2 < Z bZgl
:	< 3	:
:	< [ • $\frac{1}{4}$	; x < 3
:	Zx ∈ [-3;5]; [-2; 4; \ m > 0 ijb x ∈ 2;4; m 0 ijb x ∈ 3;2 4;5]; ] o <sub>max</sub> = 0,2; x <sub>min</sub> = 1; ^ n â ijb x ∈ 3;0 [1;2]; n ijb x ∈ 0;1 [2;5]; _ m <sub>Zbl</sub> = 6; m <sub>Zbf</sub> = - 1; ` y ∈ [- 1;6];	Zx ∈ [- 3;4]; [-2; 1; \ m > 0 ijb x ∈ 3; - 2 1;4]; m 0 ijb x ∈ 2;1; ] o <sub>max</sub> = 2; x <sub>min</sub> = - 1; ^ n â ijb x ∈ 1;2 [3;4]; n ijb x ∈ 3; - 1 [2;3]; _ m <sub>Zbl</sub> = 2; m <sub>Zbf</sub> = - 3; ` y ∈ [- 3;2];
:	; 1	< b3)
<	o 0; o 1;	o 0; o 5;
K	$y = x^2 \pm 4x + 3 = (o \pm 2)^2 \pm 1$ 1) x ∈ R; 2) y ∈ [- 1;+ ]; 3) nmgdpby h[s\_h\ b^Z4) m > 0 ijb x ∈ ; 1 3;+ ; m 0 ijb x ∈ ; 3; n â ijb x ∈ 2;+ ; n ijb x ∈ ; 2];	$y = x^2 \pm 2x + 1 = (o \pm 1)^2$ 1) x ∈ R; 2) y ∈ [- 0;+ ]; 3) nmgdpby h[s\_h\ b^Z4) m > 0 ijb \k\_oodj hf \_ n â ijb x ∈ ;+ ; n ijb x ∈ ; 1];

Kl \\_ i\\_ggZy bi hdZaZ\\_evgZy nmgdpbb

P\\_ev i j h \\_ j dZ agZgbc b i j Zdl bq\\_kdbo m f\\_gbc h [ mZx s boky

1. GZcl b h [ eZkl v hi j \\_ \\_ e\\_gby kl \\_ i\\_gghc nmgdpbb m =

2. J\\_r bl v bj j ZpbhgZevgh\\_m j Z g\\_gb\\_

Z = 2 - o

[ - = .  
3. J\_r bl v bj j ZpbhgZevgh\_g\_j Z\_gkl\h

4. Kj Z gbl v qbkeZ

$z \binom{\quad}{\quad}^{0,4} b \binom{\quad}{\quad}^{2,2};$

[  $12^{-1,8} b 12^{2,2}$ .

5. J\_r bl v mj Z\_g\_gb\_

$Z^{0+3} = 125^{0,2};$

[  $3^0 \pm 3^0 = -78;$   
 $3^2 - 4$

$\sqrt{11} = ;$

$] 77^0 - 87^0 + 1 = 0.$

6 J\_r bl v g\_j Z\_gkl\h

$Z^{0+1} = 1;$

[  $9^0 + 3^0 \pm 12 = 0.$

Dhhj ^bgZ u b \\_dl hj u

P\_ev i j h\ \_j dZ agZgbc b i j Zdl bq\_kdbo nfi \_gbc h[ mZx s boky  
\ Z bZgl

Mj h\ \_gv :

AZ hegbl \_ i j hi nkdb

1. <\_dl hj hf gZi ehkdhkl b gZau\ Z\_I ky «

2. <\_dl hj bah[ j Z Z\_I ky «

3. F h^me\_f \\_dl hj ZgZau\ Z\_I ky «

4. >\Z\\_dl hj Z\ i j hkl j Zgkl\\_gZau\ Zx I ky i j hl b\ hi heh` gh gZ j Ze\_gguf b \_keb «

5. I j b nfi gh`\_gbb\\_dl hj ZgZqbkeh «

6. >\Z\\_dl hj Zkqbl Zx I ky j Z\_guf b \_keb «

Gne\\_hc \\_dl hj dheebg\_Z\_g..... \\_dl hj m

Mj h\ \_gv <

8. GZc^bl \_dhhj ^bgZ u \\_dl hj Z , \_keb : -1;3) b < -2;4).

9. >Zgu \\_dl hj u b

10. >Zgu I hqdb : b < - GZ hkb HM gZc^bl \_ I hqdmF m j Z ghm^Zezggmx  
hl

I hq\_d : b < LhqdzH ± gZqZeh dhhj ^bgZ

Mj h\ \_gv K

11. Y\eyx I ky eb \\_dl hj u b , \_keb : - < - K - ? "

Mj h\ \_gv :

AZ hegbl \_ i j hi nkdb

1. <\_dl hj hf \ i j hkl j Zgkl \ \_gZau\Z\_ | ky «
2. <\_dl hj h[ hagZqZ\_ | ky «
3. >ebghc \ \_dl hj ZgZau\Z\_ | ky «
4. >\Z \ \_dl hj Z \ i j hkl j Zgkl \ \_gZau\Zx | ky h^bgZdh\ h gZ j Z e\_gguf b \_keb «
5. >ey | h] h ql h[ u keh` bl v ^\Z \ \_dl hj Z gm gh «
6. Græ \ \_uf \ \_dl hj hf gZau\Z\_ | ky «
7. >\Z \ \_dl hj ZgZau\Zx | ky dheebg\_Z\_ | guf b \_keb «

8. GZc^bl \_dhhj ^bgZ u \ \_dl hj Z \_kebC(6;3;- b' -5).

>Zgu \ \_dl hj u b GZc^bl \_ .  
 >Zgu | hqdb : -2; 0) b < - GZ hkb H= gZc^bl \_ | hqdmF ] j Z ghm^Zezggmx  
 hl | hq\_d : b < LhqdzH ± gZqZeh dhj ^bgZ

Mj h \ \_gv K

11. Y \ eyx | ky eb \ \_dl hj u b \_keb K -1;3) ,M(2;-2;4), : - b < -5;-4;5)?

Dj bl \_j bb hp\_gdb dhgl j hevghc j Z hl u

AZ^Zgby	; Zeeu	j bf _qZgb_
1 ±7	7	DZ ^uc i j Z bevguc hl \ _   1 [ Zee
8 ±10	6	DZ ^uc i j Z bevguc hl \ _   2 [ ZeeZ
11	3	DZ ^uc i j Z bevguc hl \ _   3 [ ZeeZ

F Zdkbf Zevgu c [ Zee aZj Z hl m±16 [ Zeeh\  
 R dZeZi \_j \ h^Z [ Zeeh \ hl f \_ | db

Hl f _   dZ	Qbkeh [ Zeeh \ g_h [ oh^bf h _ ^ey i hemq_gby hl f _   db
© <sup>a</sup> hl ebqgh	16 - 15
© <sup>a</sup> ohj hr h	14 - 13
© <sup>a</sup> m^h \ e _   \ hj bl _evgh	12 - 10
© © g_m^h \ e _   \ hj bl _evgh	f _g_ 10

I j Z bevgu \_hl \ \_ | u

	1 <Z bZgl	2 <Z bZgl
1	gZ j Z e_gguc hl j _ahd	gZ j Z e_gguc hl j _ahd
2	Z 7	Z 7
3	^ebgZ \ _dl hj Z	^ebgZ hl j _adZ
4	dheebg_Z_   gu b bo gZ j Z e_gby g_ kh \ i Z^Zx	bo gZ j Z e_gby kh \ i Z^Zx
5	gZw h qbkeh nfi gh` Zx   ky dhj ^bgZ u \ _dl hj Z	keh` bl v bo dhj ^bgZ u
6	hgb khgZ j Z e_gu b bo ^ebgu j Z gu	\ _dl hj mdhl hj h] h gZqZeh b dhg_p kh \ i Z^Zx
7	ex [ hf m	hgb e` Z gZi Z Zee_evgu o beb gZh^ghc i j yf hc
8	: ←{- 3;- 1;1}	CD ={- 4;1;- 3}

9	$2\vec{b} - \vec{c} = \{5; -2; -1\}$ , $ 2\vec{b} - \vec{c}  = \sqrt{30}$	$\vec{a} - 2\vec{b} = \{-1; -5; 10\}$ , $ \vec{a} - 2\vec{b}  = \sqrt{126}$
10	F(0; 1; 0)	F(0; 0; -1)
11	g_d h e e b g _ Z j g u	d h e e b g _ Z j g u

Lbi h\ u \_ dhgl j hevgu \_ aZ^Zgby ^\_f h\ \_j kbb b dj bl \_j bb hp\_gb\ Zgby  
Dhgl j hevgy I hqdZ <

Eh] Z bnf bq\_kdb\_ mj Z g\_gby b g\_j Z \_gkl\ Z

P\_ev i j h\ \_j dZagZgbc b i j Zdl bq\_kdbo mfi \_gbc h[ mZx s boky

1 \ Z bZgl

: Mi j hkl bl v \ u j Z \_gb\_ b gZcl b o lg x = lg 8 + 2 lg 5 ± lg 10 - lg 2  
1) 10; 2) -1; 3) -10; 4) 0.

: GZc^bl \_ dhj \_gv mj Z g\_gby log<sub>2</sub>(3x + 1) = 3  
1) 11; 2) 1; 3) -10; 4)  $\frac{7}{3}$ .

: MdZ bl \_i j hf \_ mhd dhl hj hf mi j bgZ^e\_` bl dhj \_gv mj Z g\_gby  
log<sub>4</sub>(4 ± 0) + log<sub>4</sub> 2 = 1  
1) (-3; -1); 2) (0; 2); 3) [2; 3]; 4) [4; 8].

: GZc^bl \_ knf f mdhj g\_c mj Z g\_gby log<sub>3</sub> x<sup>2</sup> = log<sub>3</sub>(9x - 20)  
1) -13; 2) -5; 3) 5; 4) 9.

: J\_r bl \_g\_j Z \_gkl\ h log<sub>3</sub>(4 ± 2 o) 1  
1) (-' @ -' @ > '); 4) [0,5; + ').

< J\_r bl \_g\_j Z \_gkl\ h log<sub>3</sub>(3 o + 2) log<sub>3</sub>(o ± 1)  
1) (1; + '); 2) (-' -  $\frac{2}{3}$ ]; 3) [-1,5; -  $\frac{2}{3}$ ]; 4) j\_r \_gbc g\_l

< J\_r bl \_g\_j Z \_gkl\ h log<sub>9</sub>(6 - 3x) > -1  
1) (-' '); 2) (-' -10); 3) (-1; 2); 4) (-0,1; 20).

K GZc^bl \_ qbkeh p\_euo hl j bpZ\_evguo j\_r \_gbc g\_j Z \_gkl\ Z  
lg(o + 5) 2 ± lg 2  
1) 5; 2) 4; 3) 10; 4) gb h^gh]h

2 \ Z bZgl

: Mi j hkl bl v \ u j Z \_gb\_ b gZcl b o lg x = lg 12 - lg 3 + 2lg 7 - lg 14  
1) 14; 2) -1; 3) -10; 4) 0.

: GZc^bl \_ dhj \_gv mj Z g\_gby log<sub>5</sub>(2x - 4) = 2  
1) 11; 2) 14,5; 3) -10; 4)  $\frac{7}{3}$ .

: MdZ bl \_i j hf \_ mhd dhl hj hf mi j bgZ^e\_` bl dhj \_gv mj Z g\_gby  
log<sub>4</sub>(5 ± 2 o) ± log<sub>4</sub> 2 = 1  
1) (-' -2); 2) [-2; 1]; 3) [1; 2];

: GZc^bl \_ knf f mdhj g\_c mj Z g\_gby lg(4x ± 3) = 2 lg x  
1) -2; 2) 4; 3) -4; 4) 2.

: J\_r bl \_g\_j Z \_gkl\ h log<sub>8</sub>(5 ± 2 o) > 1  
1) (-' -1,5); 2) (-10; 2,5); 3) (2,5; + ' 4) (-10; + ')

< J\_r bl \_g\_j Z \_gkl\ h log<sub>3</sub> $\frac{1}{3}$ (4x - 2) < log<sub>3</sub> $\frac{1}{3}$ (3x + 1)  
1) (3; + ' ); 2) (-' -  $\frac{2}{3}$ ]; 3) [-1,5; -  $\frac{2}{3}$ ]; 4) j\_r \_gbc g\_l

< J\_r bl \_g\_j Z \_gkl\ h log<sub>10</sub>(1 - 1,4x) < -1.  
1) (0,5; ' 2) (-' -  $\frac{10}{7}$ ); 3) (1,4; 2); 4) (0,5; 7).

K GZc^bl \_ qbkeh p\_euo j\_r \_gbc g\_j Z \_gkl\ Z log(o - 2) 1  
1) 5; 2) 4; 3) [\_kdhg\_qgh f gh]h 4) gb h^gh]h



Dj bl \_j bb hp\_gdb dhgl j hevghc j Z hl u

AZ^Zgby	; Zeeu	I j bf_qZgb_
: ±:	5	DZ ^uc i j Z bevguc hl \_ 1 [ Zee
< ±<	4	DZ ^uc i j Z bevguc hl \_ 2 [ ZeeZ
K	3	DZ ^uc i j Z bevguc hl \_ 3 [ ZeeZ

F Zdkbf Zevgu c [ Zee aZj Z hl m±12 [ Zeeh\

R dZeZi \_j \\_ h^Z [ Zeeh \\_ hl f \_l db

HI f _l dZ	Qbkeh [ Zeeh \_ g_h [ oh^bf h_^ey i hemq_gby hl f _l db
© <sup>a</sup> hl ebqgh	12 - 11
© <sup>a</sup> ohj hr h	10 - 9
© <sup>a</sup> m^h\ e\_l \_ hj bl _evgh	8 - 7
© © g_m^h\ e\_l \_ hj bl _evgh	f_g_7

HI \\_l u d dhgl j hevghc j Z hl \_

	1 <Z bZgl	2 <Z bZgl
:	1) 10	1) 14
:	4) $\frac{7}{3}$	2) 14,5
:	o= 2; [2;3] (3)	o= 2,1; (2; + ' (4)
:	q = 4; q = 5; 4 + 5 = 9; (4)	q = 1; q = 3; 1 + 3 = 4; (2)
:	oD(- ' 0,5] (1)	oD(- ' - 1,5) (1)
<	oD(1; + ' (1)	oD(3; + ' (1)
<	oD(- 1; 2) (3)	oD(- ' - $\frac{10}{7}$ ) (2)
K	oD(- 5; 45], o= - 4; - 3; - 2; - 1. (2)	oD(2; 7], o= -3;4; 5; 6; 7. (1)

Dhgl j hevghc j hqdZ <

Lj b] hghf \_l j bq\_kdb\_ i j \_h [ j Zah\ Zgby \\_uj Z \_gbc

P\_ev i j h\ \_j dZ agZgbc b i j Zdl bq\_kdbo nfi \_gbc h [ m^Zx s boky

1 \\_Z bZgl

: <uqbkebl \_ sin U

1) 0,5; 2) 1; 3)  $\frac{\sqrt{3}}{2}$ ; 4)  $\frac{\sqrt{2}}{2}$ .

: GZdZdhf baq\_j l \_ \_c bah [ j Z zg ] j Zhbd nmgdpbb n#

Jbk1

Jbk2

Jbk3

Jbk4

: GZc^bl \_agZq\_gb\_ \\_uj Z \_gby VQ U FRV U FW U W U  
 1) 4; 2) ±4; 3) 6; 4)

: 4. Mi j hkl bl \_ bki hevany nhj f neu i j b \\_ ^\_gby FRVGE ^FRV GE FRVδ

1)  $\sqrt{3}$  2) 1; 3) 0;  $\sqrt{2}$   
 : I hkl j hcl \_ ]j Z hbd n m g d p b b y = 3 \sin x b m d Z bl \_ h [ e Z k l v h i j \_ ^ \_ e \_ g b y  
 b h [ e Z k l v a g Z q \_ g b c n m g d p b b  
 : H i j \_ ^ \_ e b l \_ a g Z d \ u j Z \_ g b y \sqrt{2} \hat{U} \sqrt{3} \hat{U}

1) +; 2) -; 3) 0; 4)  $g \_ l \_ \_ j \_ g h ] h h l \_ \_ l \_ Z$   
 < I h a z ^ Z g g h f m a g Z q \_ g b x I j b ] h g h f \\_ l j b q \_ k d h c n m g d p b b g Z c ^ b l \_ a g Z q \_ g b \_  
 c t g . \_ k e b s i n . b \frac{Q}{2} < . < O E

$$K > h d Z b l _ l h ^ \_ k l \_ h$$

$$\frac{\text{tg } \hat{U}}{2 \sin^2 \hat{U}} = \text{tg}^2 .$$

2 \sqrt{2} b Z g l  
 : < u q b k e b l \_ c o s \hat{U}  
 1) 0,5; 2) 1; 3)  $\frac{\sqrt{3}}{2}$ ; 4)  $\frac{\sqrt{2}}{2}$ .  
 : G Z c ^ b l \_ a g Z q \_ g b \_ \ u j Z \_ g b y \sqrt{2} \hat{U} \sqrt{3} \hat{U} \sqrt{2} \hat{U} \sqrt{2} \hat{U}

Jbk1

Jbk2

Jbk3

Jbk4

: G Z c ^ b l \_ a g Z q \_ g b \_ \ u j Z \_ g b y \sqrt{2} \hat{U} \sqrt{3} \hat{U} \sqrt{2} \hat{U} \sqrt{2} \hat{U}

1) 4; 2)  $\pm 4$ ; 3) 6; 4) .

: 4. M i j h k l b l \_ b k i h e v a n y n h j f m e u i j b \\_ ^ \_ g b y \sin ( O E \hat{\alpha} \cos ( \frac{Q}{2} - . \sqrt{3} \hat{U}

1)  $\sqrt{3}$  2) 1; 3) 0;  $\sqrt{2}$   
 : I hkl j hcl \_ ]j Z hbd n m g d p b b y = 1 + \cos x b m d Z bl \_ h [ e Z k l v h i j \_ ^ \_ e \_ g b y b  
 f g h ^ \\_ k l \\_ h a g Z q \_ g b c n m g d p b b  
 : H i j \_ ^ \_ e b l \_ a g Z d \ u j Z \_ g b y \sqrt{2} \hat{U} \cos \hat{U}

1) +; 2) -; 3) 0;  $g \_ l \_ \_ j \_ g h ] h h l \_ \_ l \_ Z$   
 < I h a z ^ Z g g h f m a g Z q \_ g b x I j b ] h g h f \\_ l j b q \_ k d h c n m g d p b b g Z c ^ b l \_ a g Z q \_ g b \_ t g .

\_ k e b c o s . 0,8 b \frac{Q}{2} < . < O E

$$K > h d Z b l _ l h ^ \_ k l \_ h$$

$$\frac{\text{tg } \hat{U}}{2 \cos^2 \hat{U}} = \text{tg } \hat{U}$$

$$\frac{\text{tg } \hat{U}}{\sin^2 \hat{U} - \cos^2 \hat{U}} = - \sqrt{2} .$$

Djbl\_jhlp\_gdbgljhevzhl

AZ^Zgby	;Zeeu	ljb_f_qZgb_
: ±:	6	DZ`^uiçZ\bevghulà_1 [Zee
<	2	DZ`^uiçZ\bevghulà_2 [ZeeZ
K	3	DZ`^uiçZ\bevghulà_3 [ZeeZ

FZdkbfZev\ZeeZ[hlm1 [Zeeh\

RdZáZj\_\h↑Zeehhlf\_ldb

Hlf_ldZ	QbkçZeeh\h[oh^b^nyhemq_hlfyldb
© <sup>a</sup> hlebqgh	11-10
© <sup>a</sup> ohjhrh	9-8
© <sup>a</sup> m^h\e_\l\hjbl_evq	7-6
© © g_m^h\e_\l\hjb	f_g_6_

HI\\_lddhgljhevzhl

	1 <ZjbZgl	2 <ZjbZgl
:	1) 0,5	3) $\frac{\sqrt{3}}{2}$
:	jbk	jbk
:	1) 4	3) 6
:	3) 0	2) 1
:	oDR; mD[- 3; 3]	oDR; mD[ 0; 2]
:	2)-	2)-
<	$-\frac{3}{4}$	$\frac{3}{4}$

DhgljhevzhdZ

Bkke\_^h\Zmgdplbhfhsvxijhba\h^ghc

P\_evjh\\_jdzgZgbájZdlbq\_kmb\_ogth[mqZxsboky  
1 \ZjbZgl

Mjh\\_gv

: Kdhev\chl\\_j\Zem[u\Zgbf\\_rlmgdplb]e= ð ±3 ð

: 1. ; <3. = Gbh^gh]h

: Kdhev\chl\\_j\Zem[u\Zgbf\\_rlmgdplb]e= ð ±9 ð + 15 ð

: 2. ; <3. = Gbh^ghc

: AgZq\\_gmgdplb±ð + 4o+2 \lhqdf\_ZdkbfmfZ\gh «

: 0. ; <6. =

: Lhqdf\_ZdkbfmfZgdpbb= 16ð+ 81ð ±21o±2 y\ey\_lky «

: ±1. ; < ±3. = ±3,5.

Mj h\ \_gv <  
 < >ZgZ nmgdpby f(x) = x<sup>3</sup> ±3x ±6. GZc^bl \_ i j hf \_` m db \ haj Zkl Zgby b nfi u\ Zgby nmgdpbb  
 Mj h\ \_gv K  
 K Bkke\_^nci \_ ki hf hs vx i j hba h^ghc nmgdpbx l o = 0 ±3 0 ±9 o b i hkl j hcl \_ \_z  
 j j Z hbd

2 \ Z bZgl  
 Mj h\ \_gv:

: Kdhevdh bgl \_j \ Zeh\ \ haj Zkl Zgby bf \_l nmgdpby l o = 0 ±3 0?  
 : 1. ; Gb h^gh] h < 2. = 3

: Kdhevdh dj bl bq\_kdbo l hq\_d bf \_l nmgdpby l o = 0 ±6 0 + 9 o  
 : Gb h^ghc ; 3. < 1. = 2.

: AgZq\_gb\_nmgdpbb m 2 0 - 8 o + 11 \ l hqd\_ f bgbf mfi Z j Z gh«  
 : 0. ; < 2. =

: Lhqdhc f bgbf mfi Z nmgdpbb l o = 16 0 + 81 0 ±21 o ±5 y\ey\_l ky«  
 :  $\frac{1}{8}$ . ; . < 8. = 4.

Mj h\ \_gv <  
 < >ZgZ nmgdpby f(x) = x<sup>3</sup> - 3x + 2. GZc^bl \_ i j hf \_` m db \ haj Zkl Zgby b nfi u\ Zgby nmgdpbb  
 Mj h\ \_gv K  
 K Bkke\_^nci \_ k i hf hs vx i j hba h^ghc nmgdpbx l o = 0 ±3 o + 1 b i hkl j hcl \_ \_z j j Z hbd

Dj bl \_j bb hp\_gdb dhgl j hevghc j Z hl u

AZ^Zgby	; Zeeu	l j bf_qZgb_
: ±:	4	DZ ^uc i j Z bevguc hl \ _l 1 [ Zee
<	2	DZ ^uc i j Z bevguc hl \ _l 2 [ ZeeZ
K	3	DZ ^uc i j Z bevguc hl \ _l 3 [ ZeeZ

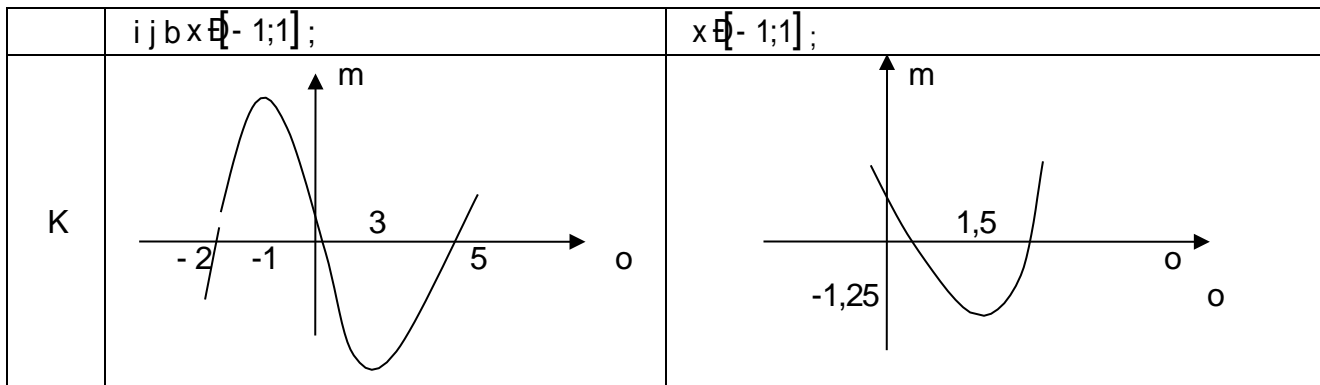
F Zdkbf Zevgu c [ Zee aZj Z hl m±9 [ Zeeh\

R dZeZi \_j \ h^Z [ Zeeh\ \ hl f \_l db

Hl f _l dZ	Qbkeh [ Zeeh\ g_h [ oh^bf h_^ey i hemq_gby hl f _l db
© <sup>a</sup> hl ebqgh	9 - 8
© <sup>a</sup> ohj hr h	7 - 6
© <sup>a</sup> m^h\ e_l \ hj bl _evgh	5 - 4
© ©_g_m^h\ e_l \ hj bl _evgh	f_g_4

Hl \ \_l u d dhgl j hevghc j Z hl \_

	1 < Z bZgl	2 < Z bZgl
:	:	<
:	: 2.	=
:	<	=
:	= -3,5.	$\frac{1}{8}$ .
<	n â i j b x Ð ; - 1] [1; + ; n	n â i j b x Ð ; - 1] [1; + ; n i j b



Dhgl j hevgZy l hqdZ  
H[ t z f u f gh]h]j Zggbdh\

P\_ev ij h\ \_j dZ agZgbc b ij Zdl bq\_kdbo m\ \_gbc h[ mZx s boky

Mj h\ \_gv :

- : DZdhc g\_f h` \_l [ulvij baf Z'
- : I j yf hc ; GZdehgghc < I j Z bevghc = Mk\_q\_gghc
- : DZdZy nhj f mæZbki hevam\ ky ^ey \u qbke\_gby h[ t\_f Zi j baf u ]^\_R ± j Z^bntk hkgh\ Zgby H ± \ukhl Z
- :  $\frac{1}{3} S_{hkg} H; ; \mathbb{R}^2 H; < S_{hkg} H; = \frac{1}{3} H \mathfrak{A} + S_1 + \sqrt{SS_1} \ddot{a} \emptyset$
- : GZah\bl \_ dZdZy nb]m] Zg\_y\ey\_l ky ij Z bevguf f gh]h]j Zggbdhf
- : Dm\ ; >h^\_dZw^j < Hdl Zw^j = l Z Zee\_e\_i bi \_^
- : J[\_j h dm\ Zj Z gh2 kf < uqbkebl \_ km\ f m^ebg \k\_oj \_[\_j dm\ Z
- : 24 kf ; kf < 12 kf = 60 kf
- : I ehs Z^v ]j Zgb dm\ Zj Z gZ16 kf^2 < uqbkebl \_]h h[ t\_f
- : 24 kf^3; ; 48 kf^3; < 56 kf^3; = 64 kf^3.
- : Kms\_kl \m\ eb ij baf Z mdhl hj hc l hevdh h^gh [ hdh\ h\_j \_[ j hi \_j i\_g^bdmæy gh hkgh\ Zgbx "
- : >Z ; G\_

Mj h\ \_gv <

< Ba \\_j r bgu < d\ Z^j Z ZABCD kh kl hj hgbc 6 kf d \_]hi ehkdhkl bij h\ \_^zg i \_j i\_g^bdmæy BK. GZc^bl \_ h[ t z f i bj Z b^u \_kebAK = 10 kf

< Hkgh\ Zgb\_f ij baf u y\ey\_l ky ij yf hm] hevguc lj\_m] hevgbd k hkljuf m] ehf 60° b dZ \_]hf ij be\_ Zs bf d w hf m m] em j Z guf 9 kf < ukhl Z ij baf u j Z gZ10 kf GZc^bl \_ Z h[ t z f ij baf u [ i ehs Z^v i heghc i h\ \_j oghkl b ij baf u Mj h\ \_gv K

K GZc^bl \_ h[ t\_f f gh]h]j ZggbdZ bah[ j Z \_ggh]h gZj bkmgd \_ \k\_^ \n]j Zggu \_n] eu f gh]h]j ZggbdZi j yf u \_

2 \ Z bZgl

Mj h\ \_gv:

- : I j yf hm]hevguc i Z Zee\_e\_i bi ^ ± w h
- : I bj Z b^Z ; I j baf Z < Hdl ZMj = L\_j ZMj
- : H[t\_f i bj Z b^u hi j ^\_ey\_l ky i h nhj f me\_ ]^ S\_hkg - i ehs Z^v hkgh\ Zgby H ± \ u khl ZR ± j Z^bnk
- : ∴  $\frac{1}{3} S_{hkg} H$ ; ∴  $\frac{1}{3} \mathbb{R}^2 H$ ; <  $S_{hkg} H$ ; =  $\frac{2}{3} \mathbb{R}^2 H$ .
- : : i hn\_f Z ± w h
- : H[j Zax s Zy pbebg^j Z ; < u khl Z dhgnkZ < < u khl Z [ h d h \ h c ] j Zgb i bj Z b^u = < u khl Z nk\_q\_ggh] h dhgnkZ
- : Baf \_j\_gby i j yf hm]hevg h] h i Z Zee\_e\_i bi ^ Zj Z gu2 kf 3 kf b5 kf < u qbkebl \_] h h [ t\_f
- : 30 kf<sup>3</sup>; ; kf<sup>2</sup>; < kf<sup>2</sup>; = kf<sup>2</sup>.
- : J[\_j h dnj Zj Z gh2 kf < u qbkebl \_i ehs Z^v i h \ \_j oghkl b dnj Z
- : kf<sup>2</sup>; ; kf<sup>2</sup>; < kf<sup>2</sup>; = 18 kf<sup>2</sup>.
- : Kns\_kl \ m] e b i j baf Z bf \_x s Zy20 j \_j "
- : > Z ; G\_j

Mj h\ \_gv <

< Hkgh\ Zgb\_ i j yf h c i j baf u - i j yf hm]hevguc I j \_m]hevgbd k dZ \_hf 5 kf b ]bi hl\_gn^hc 13 kf < u khl Z i j baf u j Z gZ10 kf GZc^bl \_ h [ t z f i j baf u

< < i j Z bevg h c q\_l u j z o m]hevg h c i b j Z b^\_ [ h d h \ u \_ ] j Zgb gZdehg\_gu d i e h k d h k l b h k g h \ Z g b y i h ^ m] e h f ^ 0, Z h k g h \ Z g b \_ j Z g h k f G Z c ^ b l \_ Z h [ t z f i b j Z b ^ u [ i e h s Z ^ v i h e g h c i h \ \_j o g h k l b i b j Z b ^ u Mj h \ \_g v K

K GZc^bl\_h[t\_f f gh]h]j ZggbdZ bah[j Z\_ggh]h gZj bkmgd\_ \k^ \ m]j Zggu\_m]eu i j yf u\_

Dj bl\_j bb hp\_gdb dhgl\_j hevg h c j Z hl u

AZ^Zgby	; Zeeu	I j bf_qZgb_
: ±:	6	DZ ^u c i j Z bevguc hl \ _ 1 [ Zee
< < K	9	DZ ^u c i j Z bevguc hl \ _ 3 [ ZeeZ

F Zdkbf Zevgu c [ Zee aZj Z hl m±15 [ Zeeh\

R dZeZi \_j \_h^Z [ Zeeh \ \ h l f \_l db

Hl f _l dZ	Qbkeh [ Zeeh \ g_h [ oh^bf h _^ey i h e n a _gby hl f _l db
© <sup>a</sup> hl ebqgh	15 - 14
© <sup>a</sup> ohj hr h	13 - 11
© <sup>a</sup> m^h \ e _l \ hj bl _evgh	10 - 8
© © g_m^h \ e _l \ hj bl _evgh	f_g__8

Hl \ \_l u d dhgl\_j hevg h c j Z hl \_

	1 < Z bZgl	2 < Z bZgl
:	]	[
:	\	Z
:	]	\

:	Z	Z
:	[	[
:	[	[
<	96 k f	300 k f
<	Z405√3 k f; [ √3 + 270 k f;	Z12√3 k f; [ 24 √3 + 36 k f;

3.1.> \_eh\B yjZ

> \_eh\Z]j Zwlne Z g b j m j Z Z h l Z [ m q Z x s b \ u k i h e g y \_ f i Z a Z ^ Z g b i x b  
f \_ l h ^ b q \_ k j d h d f h \ h ^ k j l \ i h ^ Z \ Z l g k [ y a ] l g \_ i h k j \_ ^ k l \ \_ m g l Z ] k l b y  
> \_eh\Z]j Z u i h e g y j y ^ n m g d p b j c ^ d h l h j u d k h [ \_ g g h \_ e y x l k y  
1) j Z a \ b \ Z x s Z h y \ u r \_ g d m e v l m j f u k l \ \_ g g l h j h ^ Z j b h [ s \_ g d \ \ h j q \_ k d b f  
\ b ^ Z f \_ y l \_ e v g h k h h Z s \_ g g l \_ e e \_ d l m Z e l v g h u [ g h k l m ^ \_ g l h \  
2) h j b \_ g l b j m x b Z k l b f m e b j m x s i z h y p \_ k k h r f m q \_ g i j b ^ Z \_ l k r y k d h j \_ g b b \_  
f h l b \ Z p b y  
3) \ h k i b l Z l \_ e v g Z h y j f b j m x l k b j Z a \ b \ Z x l k i y h n \_ k k b h g Z e v d g Z u q \_ k l \ Z  
k i \_ p b Z e b k l Z  
4) b k k e \_ ^ h \ Z l \_ e v h k d r z j h \ \_ i g k n k k b h g Z - e v h j h q \_ k d f u ] r h e \_ g b y  
5) b g n h j f Z p b - h d g r h q Z x s z y q \_ [ g Z y l \_ e v g k l k r i v \_ g g Z m ^ b l h j g Z g y l b y o  
P \_ e v x ^ \_ e h \ h c b ] j u y \ e y \_ l k y [ h e \_ \_ ] e m [ h d h \_ b a m q \_ g b \_ h [ m  
d m j k Z k b k i h e v a h \ Z g b \_ f j \_ d h f \_ g ^ m \_ f h c Z ^ m i j h u e g b ^ j r e y l g b c b e b h j f Z p  
b k l h q g b d h \  
A Z ^ Z q Z v e y x l k y  
1) k b k l \_ f Z l b a b Z a p Z o y j \_ i e \_ i g e m q \_ g l g u h q \_ l b q \_ k d g Z o b c j Z d l b q \_ k d b o  
m f \_ g k t m ^ \_ g l h \  
2) m ] e m [ e \_ g Z k r l b j \_ g b \_ l \_ h j \_ l b q \_ k d b o a g Z g b c  
3) n h j f b j h \ Z o n f \_ g b k i h e v a h k l Z Z l h q g e m x \_ j Z l m j m  
4) j Z a \ b l h a g Z \ Z l \_ e k i g k b [ g h l Z d l b \ g h k l ] b q Z x s b l d k j y q \_ k d h c  
b g b p b Z l k Z u f h k l h y l \_ e v l g l k l k l \ \_ g g h k j l ] Z o b a h \ Z g g h k l b  
< g \_ Z m ^ b l h d e Z y Z Z d b n h j f u j Z [ h l u d Z d  
- b g ^ b \ b ^ m Z e a Z g y l b y f Z r g b Z g y l b y  
- b a m q \_ g b \_ i j h ] j Z f f g h ] h f Z l \_ j b Z e Z m q \_ [ g h ] h i j \_ ^ f \_ l Z j Z [ h l Z  
e \_ d p b b  
- b a m q \_ j g l d h f \_ g ^ m b k u l o q g b d h \  
- d h g k i \_ d l b j h b Z g h b q g b d h \  
- j Z [ h l Z k e h \ Z j y b f b i j Z \ h q g b d Z f b  
- j Z [ h l Z w e \_ d l j h g o u f r b h j f Z p b h g j g u k f r b j k Z f b k m j k Z f e t n e t Q W  
- k h k l Z \ e k o b f Z [ e b p e k b k l \_ f Z l b a r z o b l o g h Z h \_ j b Z e Z  
- \ u i h e g \_ g b k l h \ a z ^ Z g b c  
- h l \ \_ l g Z d h g l j h e v g h u j h k u  
- g Z i b k Z w k k l \_ a b k k h d e Z f h h \_ j Z l h \  
- k h k l Z \ e ] g b k k Z d j h k k \ h j l ^ Z l h l \_ f Z ^ b k p b i e b g u  
L \_ f u > \_ e h \ b j u i h i j \_ ^ f \_ l o F Z l \_ f Z l b d Z ^ a  
1. l j \_ h [ j Z a h \ Z Z p b h g Z e v g j u Z o p b h g Z e k l g u o g g i u h o d Z a Z l \_ e v g u o  
e h ] Z j b n f b q \_ k d Z o \_ g b c J \_ r j b g b j h b a Z ^ Z q  
2. l j b ] h g h f \_ l j b q n k o g d p b o k \ h c k l b Z j Z n b d b \_ r \_ g b j b f \_ j h b  
a Z ^ Z q  
3. = j Z n b d m g d p i h k l j h \_ g j Z n b d m m g d p o Z ^ Z g g Z i a e b q g u f b  
k i h k h [ Z f b

- 4. Bah[jZ`\_gZd\_hhj^bgZlghkcdhkgb`\_kl)\Zr\_gbncjZ\g\_gbc  
g\_jZ\\_gkkl\mfy\_j\_f\_ggufbokbkl\_f
- 5. =\_hf\_ljbq\_kfdukdaij\_^\_e\_gg[h]jZbe\_zhijbf\_g\_gcb\_  
\uqbke\_igethsZ^iechkd b b]mj
- 6. Hkgh\Zg\_bkhlZhdh\Zhy\\_joghk[ÿZamxšZg\\_jldZ
- 7. Hk\\_uk\_q\_gdky\_q\_gibZjZee\_ehggh\Zgbx
- 8. lj\_^klZ\e\_hjZ\bevfg[h]jZggblZjZwdrjn[hdlZw^j  
^h^\_dZbv^jkhkZw^j
- 9. KdZe\_hjijhba\\_^\_gbl\_hjh\

Djbl\_jbtp\_gchklg uoi jhkhi'bkvf\_gghuiphkhkZfhklhyl\_evjZfcl u  
Hkgh\gufb nhjfZfb ijh\\_jdb agZgbc b mf\_gbc h[mqZxsboky  
ibkvf\_ggZy kZfhklhyl\_evgy b dhgljhevgZbyZ[g bZu o lbb nhplgguob\_  
ij\_ih^Z\ZI\_ev \ i\_j\mx hq\_j\_^v mqblu\Z\_l ihdZaZgg\_u h[mqZxs b  
aZ\bklZld`hlgZeb qoyZjZdlijZj\_rghkl^rcims\_gg[u]mqZxsbfky

Kj\_^b ih]j\_rghkl\_c \u^\_eyxky hrb[db b g\_^hqZlulkyh]j\_bfg h  
\_kehgZk\b^\_l\_evklh rhfl qihmq\_ggdh\ez^\_hkggh\gufgZgbyfrf\_gbyfb  
mdZaZggufbjh]jZff\_D g\_^hq\_lZfghkylky]j\_rghkl\b^\_l\_evkl\mksb\_  
g\_^hklZlhqgh iheghf beb g\_^hklZlhqgh ijhgghf mkmf\_ggbc bkg h  
hikmlkl\hZgbc\_kqblZxs b òkiyh]jZff\_hkgh\gufg\_^hq\_lZZd`kqblZxlky  
ih]j\_rghklbhjhug\_ijb\\_ed bkdZ`\_gbfuxeZhemq\_gghqhg b dZf^Zgtbeyb  
kikhk[Z\_]h \uiheg\_gby g\_ZddmjZlgZy aZibkv gZ[j≡]ZgbpZuifhe  
hrb[dZfbg\_^hq\_lZfby\_lky\_g\_dhlhjhlc\_i\_gbkeh\ghj b h^gbh[klhyl\_evkl\  
^hims\_ggZy h[mqZxsbfky ih]j\_rghklv fh`\_l jZkkfZljb\Zlvky ij\_i  
^jm]hj\_fybijb^jm]hdklhyl\_evklZg\_^hq\_l

AZ^Zgbeymklghhhibkvf\_ggghjhkhkZ[mqZxs b kklh yblal\_hj\_l bq\_kdb  
\hijhkhà aZ^Zkl\\_lgZl\_hj\_l bq\_kdbjchkkqblZ\_[kya mij\_qgufelbkh\h\_fm  
kh^\_j`Zgbx iheghklvx khh\\_lkl\m\_l \hijhkm kh^\_j`bl \k\_g\_h[oh  
h[hkgh\Zggu\h^uZ\_]hbaeh`\_gbb\_ikvf\_ggZzyibkfZl\_fZl bq\_kjZbhlgw  
hle bqZxlky ihke\_^h\Zl\_evghklvx b ZddmjZlghklvx J\_r\_gb\_aZ^Z  
ijZ\bevgh \u[jZg kikhk[ j\_r\_gby kZfh j\_r\_ggth[okh'ibhùhb^Z[tlkyg\_g  
\\_jgh- \uiheg\_ggm`gu\uqbke\_gbyij\_h[jZah\Zgbp\_mq\_gjguchl\\_l  
ihke\_^h\Zl\_bZvdghmjZalZhb kZgh j\_r\_gb\_

< hkgh d rjbl\_jbhp\_gchq\_[g^h\_cyl\_evghkrhZxs b òkeh`\_gh\_t\_dlb\ghkl  
b\_^bguid^oh^jb iyldZe evghkckl\_fhp\_gb\Zggyk\_òb^h]Z[hlmklZgh\eg  
h[s\_^b^Zdlb qj b d b j b b

Hlf\_l dZ<sup>a</sup>

1. AgZgbijhgbfZgbjym[bgnuk\h\_grb[ymqZxs b fky]h[t\_fZjh]jZffgh]h  
fZl\_jbZeZ

2. Mf\_gby \u^\_eylv ]eZ\gu\_ iheh`\_gby \ bamq\_gghf fZl\_jbZ  
ijbf\_jh\h[h[sZlv ^\_eZlv \u\h^u mklZgZ\eb\Zlv f`ij^f\_lgu\_ b  
l\hj\_q\_kidbf\_gyihemq\_gaggZ\_gby\_agZdtkbhl on Zpb b

3. Hikmlkl\brb[hdb g\_^hq\_ljh b \hkijhba\\_^\_bgabnq\_ggfZ]hjbZèZ  
mklZgh\egghf\_ijb mklguhl\\_lZrokljZg\_gb^\_evggu\_olhgghkkl\_i\_kfhsvx  
^hihegbl\_evghujòkhiy\_ih^Z\ZI\_keny]ex^\_gdm evlmi'pukvf\_ggth onklghj\_cqb  
ijZ\b enhjfe\_gby ibkvfZghluo

Hlf\_l dZ<sup>a</sup>

1. AgZg[k\_]hamq\_gig h]jZffgh]Zl\_jbZeZ

2. Mf\_gbc \u^\_eylv ]eZ\gu\_ iheh`\_gby \ bamq\_gghf fZl\_jbZ  
ijbf\_jh\h[h[sZlv ^\_eZlv \u\h^u mklZgZ\eb\Zl]hmbij\_^f\_lguyabijbf\_gylv  
ihemq\_gaggZ\_gbyjZgZlbd\_



3. G\_agZqbl\_evggijm[uhrb[db g^hq\_lujb \hkijhba\\_^\_bgabmq\_ggh  
fZI\_jbZekZ[ex^\_gkgh\gubZ\b edmevlmijbukvf\_ggbcmlghjc\_qb ijZ\be  
hnhjfe\_gbkvf\_ggijphi

Hif\_idZ a

1. AgZgb\_mk\h\_gfZl\_jbZgZ mjh\gfbgbfZevgljo[h\Zgbjch]jZffu  
aZijm^g\_igb\_kZfhklhyl\_evgghijhba\\_^\_ggbb[oh^bfrgk\_lagZqbl\_e\_kghscb  
ij\_ih^Z\Zl\_ey

2. Mf\_gbjZ[hIZlgZ mjh\g\hkijhba\\_^\_gZijm^g\_gjby hI\\_lZgZ  
\b^hbaf\_g\_gghjku

3. GZebqb\_ jjm[hc hrb[db beb g\_kdhevdkbjhbg\_\]jm[ulob ijdbam  
fZI\_jbZeZ g\_agZqbl\_evgg\_ g\_kh[ex^\_gb\_ hkgh\guo ijZ\be dme  
ijZ\b hnhjfe\_gby ibkvfZghguo

Hif\_idZ a

AgZgb\_ b mk\h\_gb\_ fZI\_jbZeZ gZ mjh\g\_ gb`\_ fbgbfZe  
hI^\_evgiu^kIZ\egbyamq\_gfZhf\_jbZe\_HIkmlklvf\_gjZ[hIZgZmjh\g\_  
\hkijhba\\_^\_agZijm^g\_igb\_yI\\_lZgZklZg^Zjlgkijhk. GZebqg\_kdhevdb  
]jm[uhrb[hd[hev rh]qbked\_]jm[uiob \hkijhba\\_^\_bgabmq\_ggfZ]h\_jbZeZ  
agZqbl\_evggh[ex^\_gkgh\gubZ\b edmevlmijbukvf\_ggbcmlghjc\_qbijZ\be  
hnhjfe\_gbkvf\_ggijphi

Djbl\_jbb\_hp\_gb\Zgby\uiheg\_gby ij\_a\_gIZpbb

H[t_f \uiheg_g	F_g 50%	H 50-70%	H 70-90%	H 90-100%
jZ[hlu hif_idZ	2	3	4	5

Hif\_idZ

1. <uiheg bjZ[hIjm ar b[hlg\_ ^hq\_lh\  
2. >himklbehe\_h^ghgh^hq\_lZ

3. <jZ[hIZkoba[ulhqgiblgkIvZ^Zg^hcmkdZ\uklyZ\egbf\_idZ a\  
khhI\\_lklkbeZjZg\_\_ h]h\hj\_gguf ghjfZlb\hf

Hif\_idZ

1. <uiheg bjZ[hIjm h eg hklvgh^himklbeeg\_cg\_[he\_h^ghg\_]jm[hcb[dbaZ  
bkdexq\_gb\_f j\_r\_gby dhebq\_kl\\_gguo nbabq\_kdbo aZ^Zq b h^  
g\_ ^hq\_lh\  
2. <jZ[hIZkoba[ulhqgiblgkIvZ^Zg^hcmkdZ\uklyZ\egbf\_idZ a\  
khhI\\_lklkbeZjZg\_\_ h]h\hj\_gguf ghjfZlb\hf

Hif\_idZ

1. ijZ\bevgh \uihegbe g\_ f\_g\_\_ iheh\bgu jZ[hlu beb ^himklbe g  
beb g\_ [he\_\_ h^ghc ]jm[hc b h^ghc g\_]jm[hc hrb[db b h^gh]d g  
g\_]jm hrb[hd beb \uihegbe j\_r\_gb\_ dhebq\_kl\\_gghc nbabq\_kc  
\u\h^Z jZ[hq\_c nhjfmeu ijb gZebqbb ijZ\bevgh]h hI\\_lZ beb h^  
g\_ ^hq\_brebbj b h k m k l h r b [h ghijbgZebqbb\_luj\_ivlbg\_ ^hq\_lh\  
2. <jZ[hIZkoba[ulhqgiblgkIvZ^Zg^hcmkdZ\uklyZ\egbf\_idZ a\  
khhI\\_lklkbeZjZg\_\_ h]h\hj\_gguf ghjfZlb\hf

Djbl\_jbb hp\_gb\Zgby \uiheg\_gby ij\_a\_gIZpbb

Djbl\_jbb\_gdb

‡ khhl\\_lklkbe^\_j`Zg\_bfy1 [Zee

‡ ijZ\bevghZjymdlmjbjh\Zgghk]fZpbb[Zeeh\  
‡ gZebqbb]bq\_kklyebbaeh`\_gghrghjfZpbb[Zee

‡ wkl\_l bqghrkhyfe\_gbykhhl\\_lklkbe[h\Zgby[ZeeZ

‡ jZ[hIZ ij^kIZ\egZ \ kjhd [Zee

FZdkbfZevgh\_ dhebq\_kl\h [Zeeh\  
14-15 [Zee khhl\\_lklkhp\_g@\_a

11-13 [Zeeh@ a

8-10 [Zeeh© a  
f\_g\_8\_[Zeeh© a

Djbl\_jbhp\_gb\ZggnyhjZpbhggh][hs\_gby\_f\_  
lh^]hlh\dZ bgnhjZpbhggh]h±wlh[sb^gby\_Zm^blhjghc kZfhklhyl\_ev  
ih^]hlh\d\_g\_[hevrrh]hmiklghfjhfhh[s\_gby^ey ha\mqb\Zgby gZ k\_  
ijZdlbq\_kadZgylk bh[sZ\_bZynhjZpghyk bZjZdm\_ljhqg\_ggby[h[s\_gbyk\_  
gh\ba g hjZ`Zkh\j\_f\_gg a peyh hij\_^\_e\_gig u fe\_fZf  
Khh[s\_gb\_hlebqZ\_lky hl^hdeZ^h\ bh[t\_nfhjZ bhgn g jfZp e b d hg h b \_\_  
oZjZdl\_±kfh[s\_gby^hihegyxl bamqZ\_fuc \hijhklZ Zbkl bbqq\_kkdbf-bb bfeZ  
jbZeZfb Hnhjfeylky aZ^Zgb\_ibkvf\_ggh hgh fh`\_l \dexqZlv we  
beexkljZp b bhgkljZpbx

J\_]eZf\jglf\_ggZha\mqb\Zg b[s\_gby fbg

AZljZ\ju\_f\_ggZ h^]hlh\dlm[s\_gabZ\ b khlj m^gh k [bh j ZgnhjZp k b h`ghklb  
fZl\_jbZeZ ih l\_f\_ bg^b\b^mZevguo hkh[\_gghkl\_c h[mqZxs\_]hky  
ij\_ih^Z\Zl\_±jbf\_glbjh\hvg hvg Z h^]hlh\dlm h Zpbhggh]h[s\_gby

Djbl\_jbhp\_gdb  
‡ ZdlmZevghfklv[Zee  
‡ khhl\\_lklk b^\_j`Zg\_bfy1 [Zee  
‡ ]em[big ZjZ[hldZl\_jbZle[Zee  
‡ ]jZfhgh b l h egh b Z i h e v a h \Z g l b y g b d h Z e e  
‡ gZebqb\_we\_f\_glh\ gZ]ey^ghklb [Zee  
FZdkbfZe d g b b q \_ [Z l e h b \  
Hp\_g d u k l Z \ e y i h k y e b q \_ g Z h j Z g g d Z e e h \

3.2 ljh f`mlh qgZly\_klZpby

Nhg^hp\_g h q g u o ^ k \ d e x q Z \ k \_ [ j \_ ^ Z ] h ] b q \_ d k d l j h e v g h j b l \_ e v g u  
fZl\_jbZeuj^gZagZq\_gguy\_hij\_^\_e\_g k h h l \ \_ l k l \ b p e b g \_ k h h l \ \_ l k l \ b  
bg^b\b^mZ e y j g z a c h \ Z l \_ e v h g u b ` \_ g h k g h \ g i h f d Z a Z l j e a f m e v l Z h l h \ d b  
WdaZfihg mq\_[ghfjm^f\_lr FZl\_fZlb d j Z a h ^ b l k y i b k v f \_ g g h b j f \_ i h  
wdaZf\_gZpbhggu fZl\_jbZeZf ljh^he`bl\_evg h Z l b d w d l a h Z k l Z g Z e y i h l f  
(180fbgml

GZwdaZf\_igh\\_jy\_lk y h j f b j h \ Z g g h j k l \ v k l Z \ e \_ g p r a q Z x s b b k d y m j k Z  
fZl\_fZlb d Z d m g b \ \_ j k Z e y g b f d g Z m d h [ b ^ \_ y b f \_ l h ^ Z f o Z l \_ f Z l b d h \ e Z ^ \_ g b  
fZl\_fZlbq\_kdbfb agZgbyfb kth hrh v\_lgk b y r h x s b f b N=HK KHH jZa\bib\_  
fure\_gbiyhkljZgkl\\_ggh[hjZ`\_gZey]hjb l f b q \_ c k r d b e l m j u

ljb hp\_gd\_wdaZf\_gZpbhgghc jZ[hlu bkihevam\_lky iylb[Zeev  
Zll\_klZ p j b l a g Z x h k y h \ e \_ l \ h j b l \_ e v k g u m f b Z k e h [ m Z o x s b c k j y b k ^ Z q v d a Z f i h g Z  
fZl\_fZlb d e m q h l e \_ l d m g b \_ m ^ h \ e \_ l \ h j b l \_ e v g h c

Hp\_gb\Zgb\_j\_amevlZIZ wdaZf\_gZ ih mq\_[ghfm ij^f\_lm ©FZ  
khhl\\_lklk k t e ^ m x s p f b h f \_ g ^ Z p b y e l m q Z h o h ` ^ \_ g Z b y \_ k l Z p i b b k v f \_ g g h c  
nhjf\_aZ^Zgb\_kqblZ\_lky \uiheg\_gguf\\_jgh \_keb h[mqZxs b c k y  
j\_r\_g b y a b k v f \_ g g a h Z a b k b r \_ g b h g y l o g h ^ ] h j Z k k m ` ^ \_ i g h e a m q \_ g g u t e l \ \_ l

l\_j\_q\_g h i j h k h \ e y h ^ ] h l h \ d b b k v f \_ g g b c j h ( k k \_ f \_ k l j

1. Dhjg b kl\_i\_g Dhjg b g Z l m j Z e v g l h e \_ g b a q b k e Z b o k \ h c k l \ Z l \_ i \_ g b  
jZpbhgZevgufb ihdZaZl\_eyfb bo k\hckl\Z Kl\_i\_gb k ^ \_ c k l \ b l \_ e  
kl\_i\_g b \_ c k l \ b l \_ e v g d i Z a Z l \_ e \_ f

- 2. Eh]Z] bnf Eh]Z] bnf qbkeZ Hkgh\gh\_ eh]Z] bnf bq\_kdh\_ l h ^\_kl\h >\_kyl bqgu\_ b gZ] mj Zevgu\_ eh]Z] bnf u l j Z] beZ^\_ck\bc keh]Z] bnf Z b l \_j\_oh^ d gh\hf mhkgh\Zgbx
  - 3. l j \_h[j Zah\Zgb\_ Ze] \_[j Zbq\_kdbo \uj Z \_gbc l j \_h[j Zah\Zgb\_ j ZpbhgZevgu o bj j ZpbhgZevgu o kl \_j\_ggu o i hdZaZ] \_evgu o b eh]Z] bnf bq\_kdbo \uj Z \_gbc
  - 4. JZ^bZggZyf \_j Zm]eZ <j Zs Z] \_evgh\_ ^\b` \_gb\_ Kbgntk dhkbgntk l Zg] \_gk b dhl Zg] \_gk qbkeZ
  - 5. Hkgh\gu\_ l j b] hghf \_l j bq\_kdb\_ l h ^\_kl\Z nhj f m]eZ i j b\ ^\_gby Kbgntk dhkbgntk b l Zg] \_gk kmf f u b j Zaghl b ^\m] eh\ Kbgntk b dhkbgntk ^\hcgh] h m]eZ Nhj f m]eZ i heh\bggh] h m]eZ l j \_h[j Zah\Zgby kmf f u l j b] hghf \_l j bq\_kdbo nmgdpbc \ i j hba\ ^\_gb\_ b i j hba\ ^\_gby \ kmf f m <uj Z \_gb\_ l j b] hghf \_l j bq\_kdbo nmgdpbc q\_j \_al Zg] \_gk i heh\bggh] h Z] ] n] \_gl Z l j \_h[j Zah\Zgby i j hkl\_cr bo l j b] hghf \_l j bq\_kdbo \uj Z \_gbc
  - 6. l j hkl\_cr b\_ l j b] hghf \_l j bq\_kdb\_ m] Z] g\_gby J\_r \_gb\_ l j b] hghf \_l j bq\_kdbo m] Z] g\_gbc l j hkl\_cr b\_ l j b] hghf \_l j bq\_kdb\_ b g\_j Z] \_gk\Z : j dkgntk Z] ddhkgntk Z] dl Zg] \_gk qbkeZ
  - 7. Nmgdpbb H[eZkl v hi j ^\_e\_gby b f gh` \_kl\h agZq\_gbc ] j Z] nbd nmgdpbb i hkl j h\_gb\_ ] j Z] nbd\ nmgdpbc aZ^Zgguo j Zaebqguf b ki hkh[ Z] b
  - 8. K\hckl\Z nmgdpbb f hgghl hgghkl v q\_l ghkl v g\_q\_l ghkl v h] j Zgbq\_gghkl v i j bh^bqghkl v l j hf \_` m]db \haj Zkl Zgby b m] u\Zgby gZb[ hevr \_\_ b gZbf \_gvr \_\_ agZq\_gby l hqdb vdkl j \_f m] Z =j Z] nbq\_kdZy bgl \_j i j \_l Zpby l j bf \_j u nmgdpbhgZevgu o aZ] bkb f hkl \_c \ j \_Zevgu o i j hp\_kkZo b y\ e\_gbyo
  - 9. H[j Z] gu\_ nmgdpbb H[eZkl v hi j ^\_e\_gby b h[ eZkl v agZq\_gbc h[j Z] ghc nmgdpbb =j Z] nbd h[j Z] ghc nmgdpbb
  - 10. Hi j ^\_e\_gby nmgdpbc bo k\ hckl\Zb ] j Z] nbd
  - 11. H[j Z] gu\_ l j b] hghf \_l j bq\_kdb\_ nmgdpbb
  - 12. l j \_h[j Zah\Zgby ] j Z] nbd\ l Z] Zee\_ evgu c i j \_ghk kbf f \_l j by hl ghkbl \_evgh hk\_c dhj ^bgZ] b kbf f \_l j by hl ghkbl \_evgh gZqZeZ dhj ^bgZ] kbf f \_l j by hl ghkbl \_evgh i j yf hc \ [ j Zkl y` \_gb\_ b k` Z] b \_\ ^hev hk\_c dhj ^bgZ]
- Lbi h\ u \_dhgl j hevgu\_ aZ^Zgby ^\_f h\ \_j kbb b dj bl \_j bb hp\_gb\ Zgby  
 GZ\ui heg\_gb\_wdaZ] \_gZpbhgghc j Z] hl u i hf Z] \_f Z] bd\_ ^Z] \_ky3 qZkZ  
 JZ] hl Zkhkl hbl ba^\m] qZkl \_c kh^\_j` bl aZ^Zgby  
 QZkl v 1 kh^\_j` bl 17 aZ^Zgbc [Zah\h] h m] h\ gy i h f Z] \_j bZem i j ^ntk hl j \_gghf m i j h] j Z] f hc i h f Z] \_f Z] bd\_ AZ^Zgby qZkl b kqbl Zx l ky \ui heg\_gguf b \_keb wdaZ] \_gmf uc ^Ze dj Z] dh\_j\_r \_gb\_ b \ \_j gu c hl \ \_l \ \ b^\_p\_ eh] h qbkeZ beb dhg\_qghc ^\_kyl bqgghc ^j h[ b  
 QZkl v l h j Zy kh^\_j` bl [ he\_\_keh` guo aZ^Zgbc i h f Z] \_j bZem dm] kZ f Z] \_f Z] bdb l j b bo \ui heg\_gbb gm` gh aZ] bkZ] v i hegh\_j\_r \_gb\_ b hl \ \_l  
 Dj bl \_j bb hp\_gdb  
 JZ] hl Zhp\_gb\ Z] \_l ky27 [ ZeeZ] b  
 15-16 [ Zeeh\ hp\_gdZ©<sup>a</sup> m^h\ e\ \ hj bl \_evgh  
 17-18 [ ZeeZ hp\_gdZ©<sup>a</sup> ohj hr h  
 19-21 [ Zeeh\ hp\_gdZ©<sup>a</sup> hl ebqgh

<Z] bZgl < 1

1) <u qbkebl v

$$(((61 - 64^{-1} \cdot 8^{-2})^{-1}) : \frac{2}{15})^{-1}$$

;

$$2) GZcl b agZq_gb_ \uj Z _gby \sqrt[3]{\frac{12}{25} \sqrt{15(38^2 - 23^2)}}$$

;

- 3)  $\log_{0,5}(3x+1) = -2$  ;
- 4)  $\Delta ABC$  -  $\angle C = 90^\circ$ ,  $\cos A = 0,31$ .  
 $\sin B$ . ;
- 5)  $\sqrt{4\frac{1}{2} + \frac{2}{3}} = 0,24$  ;
- 6)  $\sqrt[3]{\frac{1}{\sqrt{7} - \sqrt{3}}}$  ;
- 7)  $\frac{3a^2b^3}{m^4} \cdot \frac{a}{\emptyset}$  ;
- 8)  $\log_6 \sqrt{13} = \frac{\log_6 13}{2}$  ;
- 9)  $\log_{10} 160 = \log_{10} 16 + \log_{10} 10 = 1,2041 + 1 = 2,2041$  ;  
 $\log_{10} 1000 = 3$  ;  
 $\log_{10} 1000 - \log_{10} 160 = 3 - 2,2041 = 0,7959$  ;  
 $10^{0,7959} \approx 6,25$  ;
- 10)  $\log_3 b = \frac{1}{3}$  ;
- 11)  $\Delta ABC$   $\angle C = 90^\circ$ ,  $\cos A = \frac{\sqrt{7}}{4}$ .  $\sin B$  ;
- 12)  $4^{\sqrt{6}+10} \cdot 4^{-6\sqrt{6}}$  ;
- 13)  $\sin^2 x - 2\sin x - 3 = 0$  ;
- 14)  $2\cos(x + \frac{\pi}{3}) = 1$  ;
- 15)  $1 - \sin^2 \alpha + \cos^2 \alpha = \sin^2 \alpha$  ;
- 16)  $\sin^2 x + \sin x \cos x = 0$  ;
- 17)  $\log_5(5 \pm 5x) = 2\log_5 2$  ;

\_\_\_\_\_ [

2 qZkl v

18)  $\cos 2x + \sin x = \cos^2 x$

MdZ bl \_ dhj gb i j bgZ^e` Zs b\_ hl j \_adm [0;2 Q] ;

19)  $5\sin(\frac{1}{2} + \dot{U}) + \cos(\frac{1}{2} + \dot{U}), \text{ _kebsin } \dot{U} = 0,5$  ;

2 \ Zj bZgl

1) <u qbkebl v ;

2)  $\sqrt{2 + \sqrt{\frac{68(32^2 - 15^2)}{47}}}$  ;

3)  $\log_3(2 - x) = 2$  ;

4)  $C = \check{z} \cos A = 0,24$ . <u qbkebl vsinB ;

5) <u qbkebl v ;

6)  $\frac{\log_2 \sqrt[5]{27}}{\log_2 27}$  ;

7) L\_ l j Z^v kl hbl 20 j nŕ e\_c DZdh\_gZb[ hevr \_\_qbkeh l Zdbo l l j Z^\_c f h` gh [ m^\_ l dmi bl v gZ350 j nŕ e\_c i hke\_ i hgb` \_gby p\_gu gZ25 % . ;

8)  $\cos ., \text{ _keb ba`_kl gh ql hsin } . = \frac{12}{13} b . l q_l \setminus j l b ;$

9)  $2\sin(x + \frac{\pi}{2}) = 1$  ;

10) Kl j hbl \_evghc nbj f \_gm` gh i j bh[ j \_kl b79 dnŕ hf \_l j h\ i \_gh[ \_l hgZ m h^gh] h ba l j \_o i hkl Z s bdh\ Kdhev dh i j b^z l ky aZ eZ bl v aZ kZ mx ^\_r z\ mx i hdm i dm k^hkl Z dhc \ j nŕ eyo " P\_gu b nkeh\ by ^hkl Z db i j b\ ^\_gu \ l Z ebp\_

I hkl Z s bd	Kl hbf hkl v i _gh[ _l hgZ	Kl hbf hkl v ^hkl Z db	>hi hegbl _evgu _ nkeh\ by
--------------	----------------------------	------------------------	----------------------------

	j mĭ aZl f <sup>3</sup> )	\ j mĭ	
:	2650	4400	-
;	3200	5400	I j b aZdZa_gZkrĭ f m[ hevr _ j mĭ ^hkl Z dZ [ _ki eZ gh
<	2680	3400	I j b aZdZa_ [ he_80 f <sup>3</sup> ^hkl Z dZ [ _ki eZ gh

- 11) < I j \_mĭ hevgbd\_ABC AC = BC, AB = 6,  $\cos A = \frac{3}{5}$ . GZc^bl \_ \ u khl nCH. ;
- 12) GZc^bl \_ agZq\_gb\_ \ u j Z \_gby  $3^{\sqrt{5}+10} - 3^{-5\sqrt{5}}$  ;
- 13) GZc^bl \_ dhj \_gv mĭ Z g\_gby  $x = \frac{7x-6}{x+2}$  ;
- 14) J\_r bl v mĭ Z g\_gb\_  $\sin^2 x - 6\sin x = 0$  ;
- 15) J\_r bl \_ mĭ Z g\_gb\_  $\log_3(2-2x) = 2\log_3$  ;
- 16) Mĭ j hkl bl v ;
- 17) J\_r bl v mĭ Z g\_gb\_ ;

2 qZkl v

- 18) Mĭ j hkl bl v ;
- 19) GZc^bl \_ \ k\_ j\_r \_gby mĭ Z g\_gby  $\cos 2x + \sin^2 x = \cos x$ .  
MdZ bl \_ dhj gb i j bgZ^e\_` Zs b\_hl j \_adm[- Q Q] ;

Dj bl \_ j bb hp\_gdb

AZ^Zgby	; Zeeu	I j bf _qZgb_
1 ±17	17	DZ ^uc i j Z bevguc hl \ _ 1 [ Zee
18 - 19	4	DZ ^uc i j Z bevguc hl \ _ 2 [ ZeeZ

F Zdkbf Zevgu c [ Zee aZj Z hl m±21 [ Zeeh\

R dZeZi \_j \_\h^Z[ Zeeh\ \ hl f \_l db

HI f _l dZ	Qbkeh [ Zeeh\ g_h[ oh^bf h_^ey i hemq_gby hl f _l db
© <sup>a</sup> hl ebqgh	21 - 19
© <sup>a</sup> ohj hr h	18 - 17
© <sup>a</sup> m^h\ e_l \hj bl _evgh	16 #5
© © g_m^h\ e_l \hj bl _evgh	f _g_ 15

HI \ \_l u

	1 <Z bZgl	2 <Z bZgl
1	1/8	0.04
2	0.4	6
3	x=1	x=-7
4	0.31	0.24
5	1.24	-8
6		0.2
7	$9(a^4b^6)/(m^8)$	23
8	0.5	5/13
9	8	$(-1)^n \text{OE- OE OE Q/\#}$
10		213750
11	6	4
12	256	243
13	- OE OE Q/\#	x=2, x=3
14	" OE OE OE Q/\#	[ OE Q/\#
15	$2\cos^2$ .	x=-7
16	$x_1 \text{ OE } x_2 = - \text{OE OE Q/\#}$	$1+2tg^2$ .
17	x=0.2	x= OE Q/\#
18	$x_1 \text{ OE } x_2 \text{ OE OE Q/\#}$ OE OE OE	FRV.
19	-3	$x_1 \text{ OE } x_2 \text{ OE OE Q/\#}$ - OE OE

I \_j \_q\_gv \ hi j hkh\ ^ey i h^] hl h\ db d aZq\_l mk hp\_gdhc k\_f \_kl j

1. I j bf \_j u bki hevah\ Zgby i j hba\ h^ghc ^ey gZoh` ^\_gby gZbemqr \_] h j \_r \_gby \ i j bdeZ^guo aZ^ZqZo <l hj Zy i j hba\ h^gZy \_] \_hf \_l j bq\_kdabc b nbabq\_kdabc kf uke I j bf \_g\_gb\_ i j hba\ h^ghc d bkke^h\ Zgbx nngdpbc b i hklj\_h\_gbx ]j Zhbdh\ GZoh` ^\_gb\_ kdjh hkl b ^ey i j hp\_kkZ aZ^Zggh] h nhj f m^hc b ]j Zhbdhf

2. I \_j \ hh[j ZagZy b bgl \_]j Ze I j bf \_g\_gb\_ hi j ^\_e\_ggh] h bgl \_]j ZeZ^ey gZoh` ^\_gby i ehs Z^b dj b\ hebg\_cghc I j Z \_pbb Nhj f m^Z Gvx I hgZ^ E\_c[ gbpZ I j bf \_j u i j bf \_g\_gby bgl \_]j ZeZ \ nbabd\_b] \_hf \_l j bb

3. JZghkbevghkl v m^Z g\_gbc g\_j Z\_gkl \ kbkl\_f

4. JZpbhgZevhujjZpbhgZevhujjZaZl\_evgljbjhghf\_ljbg\_kdZ\g\_gby  
kkl\_fu Hkgh\gu\_ ijb\_fu bo j\_r\_gby jZaeh`\_gb\_ gZ fgh`bl\_eb  
ih^klZgh]jZnbq\_kfdbc^

5. JZpbhgZevhujjZpbhgZevhujjZaZl\_evgljbjhghf\_ljbg\_gdZ\\_gkl\Z  
Hkgh\g\_ ijb\_fuboj\_r\_gbyBkihevah\Zgbc\_kl]jZnbdm\mgdpbj\_ j\_r\_gbb  
mjZ\g\_gbc b\_g\_jZ\\_gkl\ F\_lh^ bgl\_j\Zeh\ Bah[jZ`\_gb\_ gZ dhhj  
j\_r\_gbcjZ\g\_gbcjZ\\_gkl\mfiy\_j\_f\_ggufbckbkl\_f

6. <\_jrbguj\_[jZ]jZg b fgh]h]jZgg bZa\\_jldfZgh]h]jZggra]eu<uimdeu\_  
fgh]h]jZgg b d h j \_ V Z c e \_ j Z

7. ljbafZjyfZvgZdehgijZafZjZ\bev gZyafZjZee\_e\_iDim^

8. ljbZfb^ZjZ\bev gZjZfb^Zk\_q\_ggZyfb^Z\_ljZw^j

9. Kbff\_ljbldm[\iZjZee\_e\_i b i j b a f b i b j Z f b ^ \_

10. K\_q\_gdny[ZbafwbibjZfb^u

11. Pbebg^j b dhgmk Mk\_q\_gguc dhgmk Hkgh\Zgb\_ \ukhlZ [h  
jZa\\_jldfZgh]h]jZgg b d h j \_ V Z c e \_ j Z

12. H[t\_b\_]baf\_j\_gggl\_]jZevghZym\_eZt\_fZ

13. Nhjfmeh[t\_fZim[Zjyfhm]hevgh]Zee\_e\_i b i j b a f b i b j Z f b ^ \_  
h[t\_fZ ibjZfb^u b dhgmkZ NhjfmehsZ^b bh dhjg r g k Z l \_ N h j f m e u  
rZjZiehsZ^k\_n\_ju

14. lh^h[bl\_eHlghr\_gihesZ^i\_hd\_joghklh[ct\_fhiv^h[g\_u\_oe

Lbih\udhgljhev gauZ^Zgbyfh\\_jkb d j b l \_ j b h p \_ g b \ Z g b y

GZuiheg\_gvdaZf\_gZp b ZghglulcfZl\_fZl b^Z\_l3gZkZ

JZ[hkZklhbaf\mZkl\_kh^\_j`ZllaZ^Zgb\_

QZklv kh^\_j`bl aZ^Zg bZah\h]hjh\gjh fZl\_jbZemj^mkfhlj\_ggh  
ijh]jZffhc ih fZl\_fZlbd\_ AZ^Zgby qZklb kqblZxlky \uiheg\_gg  
djZldh\_r\_gb\\_jguc l \ \ b ^ p \_ e h d b k d Z l h g \_ q g h k y l b q g j h d b

QZklv \lhjZy kh^\_j`bl [he\_\_keh`guo aZ^Zgbc ih fZl\_jbZee  
\uiheg\_gg b b ` g a h Z i b k Z l v i h e r g h g b h l \ \_ l

Djbl\_jbhp\_gdb

JZ[h h p \_ g b \ Z 2 5 l k Z y e e Z f b

17-19 [Zeehlp\_g@Z^a m^a \ \ h j b l \_ e v g h

20-22 [Zeehlp\_g@Z^a o h j h r h

23-25 [Zeehlp\_g@Z^a h l e b q g h

### 1 \ZjbZgl

1. GZc^bl\_ ^bZ]hgZeb ijyfhm]hevgh]h iZjZee\_e\_ibi\_^Z  
hkgh\Zgbkyf kZ\ukhljZ\gZ ;kf

2. GZ lZj\_ed\_ ibjh`dh\ \Zjjug[hcf b k k \brg\_c Xey gZ  
\u[bjZ\_l h^bg ibjh`hd GZc^b \\_jhylghklv lh]h qlh hg  
;

3. GZc lbg l \_ ] j Z ( 2 cosx - 3x^2 - 3) dx ;



4.  $\int_0^2 (x^2 - x) dx$  ;

5.  $J_r \text{ bl v m} \int \Delta g_{gb} 3^{2x-1} + 3^{2x} = 108$  ;

6.  $J_r \text{ bl v g}_j \int \Delta_{gkl} \ln 3^{x^2+x-12} = 1$  ;

7.  $J_r \text{ bl v g}_j \int \Delta_{gkl} \ln |g x| = \lg 8 + 1$  ;

8.  $\vec{a} = 4\vec{i} - 3\vec{j} + 5\vec{k}$ ,  $\vec{b} = 2\vec{i} - 1,5\vec{j} + 2,5\vec{k}$  i j h \\_ j bl v \\_ dl hj ZgZdheebg\_Z ghkl v ;

9.  $S = \frac{1}{3}t^3 + 2t^2 - 3$  \ u qbkebl v kdjh hkl v l hqdb \ f hf \_gl \ j \_f \_gb t = 4c ;

10. Pbebg^j b dhgnk bf \_x l h[ s \_\_ hkgh \ Zgb\_ b h[ s mx \ u khl m < u qbkebl v h[ t \_f pbebg^j Z \_keb h[ t \_f dhgnkZj Z\_g19. ;

11. >Zgu \\_dl hj u b . GZc^bl \_ . ;

12. >Zgu l hqdb : b < - GZ hkb HM gZc^bl \_ l hqdmF m0), j Z ghm^Zezggmx hl l hq\_d : b < L hqdZH ± gZqZeh dhj ^bgZ ;

13. GZc^bl \_ ^bZ hgZev i j yf hm] hevgbdZ \_keb kl hj hgu \_] h hkgh \ Zgby 3 kf b4 kf ;

14. < u khl Z pbebg^j Z j Z gZ4 f j Zkl hygb\_ f \_ ^m hkvx pbebg^j Zb i Z Zee\_evghc \_c i ehkdhkl vx k\_q\_gby j Z gh3 f Z i ehs Z^v k\_q\_gby 32 f^2. GZc^bl \_ i ehs Z^v [ hdh \ hc i h \\_ j oghkl b pbebg^j Z ;

15. < u qbkebl v i j hba \ h^gmx n mgdpbb \ [^2-1)/(4x+1). ;

16. GZcl b l hqdb wkl j \_f mfi Zn mgdpbby = 2x^3 - 4x + 1. ;

17.  $J_r \text{ bl } _g_j \int \Delta_{gkl} \ln 49^{x+1} \left(\frac{1}{7}\right)^x$  ;

2 qZkl v

18. < i j Z bevghc q\_l uj zon] hevghc i bj Z b^\_ kh kl hj hghc hkgh \ Zgby f [ hdh \ Zy ] j Zgv gZdehg\_gZ d i ehkdhkl b hkgh \ Zgby i h^ m] ehf 60^0. GZc^bl \_ Z \ u khl mi bj Z b^u [ i ehs Z^v [ hdh \ hc i h \\_ j oghkl b ;

19.  $1x^{\lg x - 2} = 1000$  ;

20. Y \ eyx l ky eb \\_dl hj u b , \_keb : (-1;3) < (-2;4), K - ? " ;

21. Bkke\_ ^h \ Z v n mgdpbx y = 3x^2 - [ gZf hg hl hgghkl v b \ u i mdehkl v \ h] gm hkl v ;

2 \ Zj bZgl

1. I ehs Z^v [ h d h \ h c i h \ j o g h k l b p b e b g ^ j Z 2 1 I , ^ b Z \_ j h k g h \ Z g b y j Z \_ g 7 . G Z c l b \ u k h l m p b e b g ^ j Z ;

2. G Z I Z \_ e d \_ i b j h ` d h \ k y [ e h d h f k d Z n k l h c b k i \_ q \_ g v x < Z y g Z m ] Z ^ \ u [ b j Z \_ l h ^ b g i b j h ` h d G Z c ^ b \ \_ j h y l g h k l v l h ] h q l h h g h d Z \_ l k y k y [ e h d Z b ;

3. G Z c l b b g l \_ j Z e ;

4. < u q b k e b l v ;

5. J \_ r b l v m j Z g \_ g b \_ ;

6. J \_ r b l v g \_ j Z \_ g k l \ h ;

7. J \_ r b l v e h ] Z b n f b q \_ k d h \_ g \_ j Z \_ g k l \ h | o g \_ 3 ( x - 3 ) > 0 ;

&

8. . G Z c l b ^ e b g m \ \_ d l h j Z d , \_ k e b ;

9. K d h j h k l v l h q d b . < d Z d h c f h f \_ g l \ j \_ f \_ g b n k d h j \_ g b \_ [ m ^ \_ l f ;

10. G Z c ^ b l \_ [ h d h \ h \_ j \_ j h i j Z b e v g h c q \_ l u j z o m ] h e v g h c i b j Z b ^ u m d h l h j h c k l h j h g Z h k g h \ Z g b y 8 f Z \ u k h l Z j Z g Z f ;

11. > Z g u \ \_ d l h j u b G Z c ^ b l \_ . ;

12. > Z g u l h q d b : - 2 ; 0 ) b < - G Z h k b H = g Z c ^ b l \_ l h q d m F ] j Z g h m ^ Z e z g g m x h l l h q \_ d : b < L h q d Z H ± g Z q Z e h d h j ^ b g Z ;

13. K l h j h g u h k g h \ Z g b y l j Z \_ p b b j Z g u k f b k f Q \_ f m j Z g Z k j \_ ^ g y y e b g b y l j Z \_ p b b " ;

14. I e h s Z ^ v [ h d h \ h c i h \ j o g h k l b p b e b g ^ j Z j Z g Z O E ^ 2 , Z j Z ^ b n k h k g h \ Z g b y 5 f G Z c ^ b l \_ ^ e b g m h [ j Z a n x s \_ c p b e b g ^ j Z ;

15. < u q b k e b l v i j h b a \ h ^ g m x n m g d p b b y = ( 2 - 3 x ^ 2 [ ;

16. G Z c l b l h q d b v d k l j \_ f m l Z n m g d p b b y = 3 \* x ^ 3 - 2 x ^ 2 + 3 > 0 , 1 2 5 . ;

17. J \_ r b l \_ g \_ j Z \_ g k l \ h 8 ^ x ;

Q Z k l v 2

18. < i j y f h m ] h e v g h f i Z j Z e e \_ e \_ j b i \_ ^ \_ k l h j h g u h k g h \ Z g b y f b f Z ^ b Z ] h g Z e v

i Zj Zee\_e\_i bi\_^Z gZdehg\_gZ d i ehkdhkl b hkgh\Zgby i h^ mj ehf 30°.  
GZc^bl\_

Z \ukhl mi Zj Zee\_e\_i bi\_^Z [ i ehs Z^v [ hdh\hc i h\ \_j oghkl b ;  
19. J\_r bl v mj Zg\_gb\_ ;

20. Y\ eyx l ky eb \\_dl hj u b \_keb K (-1;3), M(2;-2;4), : - b  
<-5;-4;5)? ;

21. Bkke\_^h\ Z v n m d p b x y=2x^2 [ gZf hg hl hgghkl v b \ u i m d e h k l v \ h j g n t h k l v  
;

Dj bl \_j bb hp\_gdb

AZ^Zgby	; Zeeu	I j bf _qZgb_
1 ±17	17	DZ ^uc i j Z bevguc hl \_ 1 [ Zee
19 - 21	2	DZ ^uc i j Z bevguc hl \_ 2 [ ZeeZ

F Zdkbf Zevgu c [ Zee aZj Z hl m±25 [ Zeeh\  
R dZeZi \_j \_h^Z [ Zeeh\ \ hl f \_j db

Hl f _j dZ	Qbkeh [ Zeeh\ g_h [ oh^bf h_^ey i henq_gby hl f _j db
©^a hl ebqgh	25 - 23
©^a ohj hr h	22 - 20
©^a m^h\ e _j \ hj bl _evgh	19 - 17
© g_m^h\ e _j \ hj bl _evgh	f_g_17

Hl \\_j u

	1 <Zj bZgl	2 <Zj bZgl
1		\ukhl Zj Z gZ3
2	0.25	0.4
3	2sinx-x^3-3x	2sinx-x^5+3x
4	2	e-0.5
5	x=2	x=1
6	[ 1/4;3)	[ 1/4
7	x>80	x>4
8	dheebg_Zj gu	
9	32 f k	1.75 f k
10	57	
11		
12	F	M(0,0,-1)
13	5	8.5
14	OE^R	6
15	4*(2x^2+x+2)/(4x+1)^2	-2(3x^2+9x+2)/(2x+3)^2
16	± l hqdZmax, - l hqdZ max	x=0 - l hqdZ P Q [ - l hqdZmax
17	[ "-2/3	x<1

18	$\sqrt{ukhl Zj \Delta gZ}, S_{[i]=128 f^2}$	$\sqrt{ukhl Zj \Delta gZ} / 3, S_{[i]= f^2}$
19	$x_1=0.1, x_2=1000$	$x_1=0.1, x_2=10000$
20	$g\_dheebg\_Z\_gu$	$dheebg\_Z\_gu$
21	$\backslash h\grave{a}j \check{Z}kl \check{Z}\_l i j b [ \frac{1}{4} ' $ $n\grave{f} u \backslash \check{Z}\_l i j b [ \frac{1}{4} ' $ $x=5/6 \pm l hq d\check{Z}min,$ $\backslash h] g m \check{Z}y g \check{Z}h [ e \check{Z}kl b h i j \_ \wedge \_ e \_ g b y$	$\backslash h\grave{a}j \check{Z}kl \check{Z}\_l i j b [ \frac{1}{4} ' -3/4),$ $n\grave{f} u \backslash \check{Z}\_l i j b [ \frac{1}{4} ' $ $x=-3/4 \pm l hq d\check{Z}min,$ $\backslash h] g m \check{Z}y g \check{Z}h [ e \check{Z}kl b h i j \_ \wedge \_ e \_ g b y$