

**Hkjr dk ijEijkxr
xf.kr Kku
d{k&10**



**माध्यमिक शिक्षा परिषद, उत्तर प्रदेश
Uttarakhand**

y{k d e.My

funʒku

Jh l at; vxoky] vkbz, -, l -
vij e[; l fpo ½ek/; fed f"kk½
mÜkj insk] y[kuÅ

fo"lšk ijke"lž

Jherh l ž; k frokjh
l fpo ½ek/; fed f"kk½
m-i ž] y[kuÅ

l j{k.k

MkD vo/k ujsk "kekž
f"kk funšk d ½ek/; fed ½
, oa l Hk i fr] ek/; fed
f"kk ij'kn ½m- i ž] iz kxjkt

l a kst u

Jherh uhuk JhokLro
l fpo] ek/; fed f"kk ij'kn
½m-i ž] iz kxjkt

l elo; d&

- 1- Jh izdk" k fl g & ½mi l fpo&"kk½ ek-f" k-i- ½m- i ž] iz kxjkt
- 2- Jh ek; k jke ½mi l fpo& i k B; i ūrd ½ ek-f" k-i- ½m- i ž] iz kxjkt
- 3- MkD oškyh frokjh] "kk l gk; d] ek-f" k-i- ½m- i ž] bykgckn

ijke"lžkrk

- 1- Jh l R; ukjk; .k pkjfl ; k & l gk; d f"kk funšk d] f"kk funškky;] m- i ž] iz kxjkt
- 2- MkD xksoln ukjk; .k nos & , l - i k s j k t d h; Lukrdkškj egkfo- vksjk] l kuHknz
- 3- Jh l jžnz ukFk oekž & ¼ sfu-½, l šl , V i k š j] l h, e-i h- fMxh dkyst] iz k-
- 4- Jh ykythr f=i k B h & ¼ sfu-½ i oDrk] l h, -oh- b.Vj dkyst] iz kxjkt

fo"lšk l g; kx

- 1- Jh f"ko dēkj & f'k{kkfon} fnYYkh
- 2- Jh fnušk dēkj fl g & f'k{kkfon} y[kuÅ

y{k dx.k

- 1- Jh l R; ukjk; .k pkjfl ; k & l gk; d f"kk funšk d] f"kk funškky;] m- i ž] iz kxjkt
- 2- Jh "k d j "k j .k f=i k B h & ¼ sfu-½ foHkxk/; {k] , l k s i k s b ž l h- l h-] iz kxjkt
- 3- MkD v"kk d dēkj i k .Mš & ofj' B i oDrk] b ž l h- l h-] iz kxjkt
- 4- Jh mn; "k d j JhokLro & i ōž i ž k k u p k;] d s i h- b .V j d k y s t] iz k x j k t
- 5- Jh jkeQj JhokLro & i ž k k u p k; ¼ sfu-½ d y H k d j v k J e b .V j d k y ' t] iz k-
- 6- Jh nšnz jko nške[k & Ákpk;] l j Lorh fo | k efnj] jk; i g
- 7- Jh ; kxšk dēkj xirk & Á/kkukpk; ¼ sfu-½ eFkjk
- 8- Jh f"ko" k d j fl g & i oDrk ½xf.kr½ Tokyk noh l j Lorh fo | k efnj b.Vj dkyst iz kxjktA

Öbekiel eve

i kphu dky l sgh Hkkjr ea xf.kr dks i æ[k LFku fn; k tkrk jgk gÅ egf"KZ
yx/k us onkax T; ksr"K ¼yxØx 1000bDi 0½ ea dgk gSfd&

; Fkk f'k[kk e; jik. ka ukxkula e.k; ks ; FkA

rnøn~ onkax 'kL=k. ka xf. kra evkZuLFkreAA

vFkZr~ftI idkj ekj ds flj ij f'k[kk rFkk ukx"ads Qu ij ef.k
l q kksHkr gS ml h idkj l Hkh onkax 'kL=kads 'kh"KZ ij xf.kr l q kksHkr gÅ

xf.kr dh vko'; drk , oaegRo dks crkrs gq egku xf.krK egkohj kpk; Z
½50bD½ dgrs gSfd&

cgfHfoi yki % fda =SylD; s l pjkpjA

; fRdf_p}Lrq rRI oÅ xf. krsi fcuk u fgAA

vFkZr~xf.kr dsckjseacgr D; k dgukj rhuka ykda ea l pjkpj ¼pru vkS
tM½ txr ea tks Hkh oLrqfo | eku gS os l Hkh xf.kr ds fcuk l EHko ugha gÅ

Kku&foKku ds {ks= ea Hkkjr dh fo'o dks vf}rh; nsu gÅ bl ea xf.kr dh
vk/kkj Hkr l adYi uk; rks cgr gh fof'k"V gÅ 'kL; dh l adYi uk l æ; k ys[ku dh
nk'kfed ¼n'keyo½ izkkyh dk vkfo"dkj , oa vadka ds LFkkuh; eku dk Lo: i
i kphu Hkkjr dh , dh nsu gS ftI ds fcuk xf.kr ds {ks= ea dkbZ ixfr l EHko
ugha FkhA

oSnddy l s Hkkjr ea xf.kr dh mTToy ijEijk pyh vk jgh gÅ bl
ijEijk dks vuad xf.kr Klaus vi us veV; ; ksnku l svkxsc<k; k gÅ Hkkjr ds bl h
ijEijkxr xf.kr Kku l svoxr dj kus gsrq; g i qrd d{k 10 ds fyk, rS kj dh
xbz gÅ i qrd ea dYk rhu Økx gÅ

iEke Hkkx ea Hkkjr ea xf.kr dh mTToy ijEijk ds vUrXr xf.kr
ds {ks= ea Hkkjr ds fof'k"V ; ksnku dh tkudkj nh xbz gS bl Økx ea osk'kYk
, oa dVkd tS s, frgkfl d eglo ds fcUnqfn; sx; sgat" orZku ea Dh Åkl kaxd
gS; g tkudkj h fo | kFkZ; ka ds Kkuo/kZu ds l kFk&l kFk vi usnSk ds ifr xSjo dk
Hkko i Snk djus okyh gÅ

f}rh; Hlx ea **x.kuk dh ijEijlkr fof/k; k** nh xbz gā tks iz uka dks 'kh?krk vġ 'kō rk l s gy djus ea mi; ksch gā l kfk gh mūkj dks tkpus dh fof/k mi yč/k gks l s fo | kffkz ka dk vkRefo'okl c<kuse ea l gk; d gā bl Òlx ea ox] oxžvk] ?ku] ?kuevk Kkr djusdh ær fof/k; k; rFkk ?kuevk Kkr djusdh Òlx vk/kfjr fof/k nh xbz gā

; s ijEijlkr fof/k; k; tgl oržku xf.kr i kB; Øe ds iz uka dks gy djus ea l gk; d gā ogha 'kh?kx.kuk gks l s l e; dh cpr ds dkj.k ifr; ksch ijh{kkvka ds fy, ojnu gā ; s fof/k; k; oñnd xf.kr dsuke l s Hkh tkuh tkrh gā

i ĩrd ds **r}rh; Hlx** ea Hkjr ds **ieĳk xf.krkpk; Z** fclnq ds vlrxr egku xf.kr **cāxlr**, oa **Jh/kpk; Z** ds thou ifjp; , oa; kxnu l s voxr dj; k x; k gā

; g i ĩrd xlxj ea l xj gā fo | kffkz k f'k{kdk} vfHkHkkodka grqfuf'pr : i l smi; ksch gsch , s k fo'okl gā i ĩrd l s l EcfU/kr l dkjkrEd l qkoka dk l nō Lokr gā

bl l kexh dsl dyu eavud xBFka, oaxf.kr KkrFkk fo}kuka dh l gk; rk ikr gōz gā eā mu l Hkh ds ifr drKrk 0; Dr djrk gw l kfk gh eā ekuuh; mi eĳ; eakh M,0 fnušk 'kekZ th ds bl l mŌZ ea vfŌuo l dYi ds fyk, vR; Ur four Òko l svuqghr gw rFkk bl i ĩrd d" bl Lo: i rd Ākr guse ea vij eĳ; l fpo ½ek/; fed f'k{k½ Jh l at; vxokYk , oa l fpo ½ek/; fed f'k{k½ Jherh l d; k frokjh dsl rr~ekxh'kū ds Āfr eā gkfnđ ĪrKrk 0; ä djrk gā

eā l fpo ek/; fed f'k{k i fj"kn Jherh uhuk JhokLro , oamudsl g; "fx; "a dk vkŌkj Ādv djrk gw ftlg aus vYi kof/k ea bl i ĩrd ds Y"ku , oa eē.k ea viuk l g; "x Ānku fd; k gā

p&k 'kŲk Āfrink

'kd l ōr~1940

18 ekpZ 2018

M,0 vo/k ujšk 'kekZ

f'k{k funšk d ½ek/; fed ½
 , oa l Ōki fr ek/; fed f'k{k i fj"kn-
 ½mŌÁ0½ iz kxjkt

ikB; Øe

Hkx&1

Hkjr ea xf.kr dh mTToy ijEijk

- 1- oſk' kkyk
- 2- dlvk&
 - 1- 0; _tuk& i) fr
 - 2- o.k& i) fr
 - 3- 'k& i) fr

Hkx&2

x.kuk dh ijEijkxr fof/k; k

- 1- ox&
 - 1- vkuq l; sk fof/k
 - 2- l dYku&0; odYkukH; ke fof/k
 - 3- ; konuarkonuHÑR; ox±p ; "Tk; r fof/k
 - 4- }U}; "x fof/k
- 3- ox&
 - 1- foyk&
- 2- ?ku&
 - 1- vkuq l; sk fof/k
 - 2- ; konuarkonuHÑR; ox±p ; "t; r-fof/k
 - 3- vkuq#l; skj ; konuarkonuHÑR; ox±p ; "t; r-fof/k
- 4- ?ku&
 - 1- foyk&
 - 2- Hkx vk/kfjr fof/k

Hkx&3

Hkjr ds i&k xf.krpk; Z

- 1- cāx&
- 2- Jh/kjpk; Z

vuøef.kdk

v/;k;	v/;k; dk uke	i-l a
1-	oŝk' kkYkk	7
2-	dW/kød	8
3-	oxl	11
4-	oxèWk	19
5-	?ku	24
6-	?kueWk	30
7-	Økj r ds Áeç[k xf.krkpk; l 1- cãxlŕ 2- Jh/kj kpk; l	39

Hkx & 1

Hkjr ea xf.kr dh mTToy ijEijk

v/;k;&1

osk'kkyk(Observatories)

i kphudky l sgh dky x.kuk , oa xg u{k=ka rFkk i pkax vkfn ds v/; ; u grq osk'kkykvka dk fuekZk fd; k x; kA bl ds v/; ; u grq osk'kkykvka dks ge nks Hkxka ea foHkkftr dj l drsgA

¼½ i kphu osk'kkyk; a

½½ vk/kfud osk'kkyk; a

¼½ **ikphu osk'kkyk; &** bu osk'kkykvka ea lrg ij fLFkr <kps ds ek/; e l s [kxksh; x.kukvka dk dk; Zfd; k tkrk gA t; ij ds egkjt l okbz jtk t; fl g f}rh; usHkjr ea i kphu osk'kkykvka dk fuekZk djok; kA

blgkusi kpo osk'kkykvkamTt& ¼719bD¼ fnYyh ¼724bD¼ t; ij ¼728bD¼ cukj l ¼734bD½ rFkk eFkj k ¼737bD½ dk fuekZk djok; kA mTt& ddZj[skk ds utnhd fLFkr gkusdsdkj.k i kphu l e; l s dky x.kuk dk i e[k dhnzjgk gA ; g Áfl) xf.krK , oa [kx"Yk'kkóh ojkgefegj dh tile LFKYkh , oa l k/kuk LFKYkh gA orÉku ea; gk; i kphu i kpo ; U=ka¼ kacq; U=] ukMh oy; ; U=] l ekV ; U=] fnxák ; U= o fHkUkh ; U=½ ds vfrfjDr 8 bp dk byDVrfud VsyLdki] x[ckjsokyk rkjk e.My] ek3 e foHkkx ds ; U=] l syj fQYVj okyk VsyLdki] [kxksh; ekMly] l syj tkudkj dh l hOMhO ¼/hOohO\$MhOohOMhO½ , oa ykbcjh fLFkr gA

½½ **vk/kfud osk'kkyk; &** bu osk'kkykvka ea uohu mi dj.k , oa vk/kfud rduhd ds iz; kx }kjk voykdu dj x.kuk] uohu [kkst o 'kksk dk dk; Zfd; k tkrk gA bu osk'kkykvka ea vk/kfud byDVrfud VsyhLdki] dEl; Wj] mi xg vkfn ; U=ka ds }kjk [kxksh; vkadMs-fp= iklr dj 'kksk fd; k tk jgk gA Hkjr dh i e[k vk/kfud osk'kkykvka adkMkbZduky ¼rfeyukM¼ futke egy vkj tki ky jaki j ¼syakuk¼ mUkjk[k.M jkT; osk'kkyk ushrky] osqki q¼rfeyukM¼ mn; ij l syj osk'kkyk ¼jktLFku¼ x#f'k[kj blU'kjM ¼ekm.Vvkck osk'kkyk; agA

v/;k; &2

dW/kd

fdl h l d; k dks tc v{kj ds: i ea0; Dr fd; k tkrk gSml s b d W/k d p dgrsgA
 i kphu Hkkjrh; xf.krKka usbl l dYi uk dk l d; kvka dks vfhk0; Dr djusea iz s; x fd; k
 Fkka l d; kvka dks0; Dr djus dW/kd iz kkyh dk iz s; x xf.krK vk; BkV usvi us x d Fkka ea
 fd; k gA ftl l scMh&cMh jkf'k; ka dksos l xerk l s; kn dj yrs Fkka i kphudky earhu
 idkj dh dW/kd i) fr; k; i p f y r Fk h ftudk iz s; x T; k f r " k k f n x d Fkka e a f d; k x; k g A

1- 0; _tukd i) fr&bl ea v d k a 10 l s 9 rd 1/2 dks B0; ¥tukads: i ea0; Dr fd; k
 tkrk gA Lojka dk mi; s; x djrs gq l jy 'kCn cuk; s tkrsgA
 bl i) fr dk l # fuEuor-g&&

bdkn uo Vkn uo ikn i_pd ;k| "Vd {k% 'k; e- pB

bl l # dk HkkokFkz gS^d l s i k j E H k d j d s u k s v { k j i ; D r] V l s i k j E H k d j d s u k s
 v { k j i ; D r] i l s i k j E H k d j d s i k p v { k j i ; D r] ; l s i k j E H k d j d s v k B v { k j i ; D r
 Øeku d k j v d k a d k s 0; D r d j r s g A , o a { k ' k ; d k s 0; D r d j r k g A p

bl dksbl idkj fy[kk tk l drk g&

1	d	V	i	;
2	[k	B	Q	j
3	x	M	c	y
4	?k	<	Hk	o
5	3	.k	e	'k
6	p	r		"k
7	N	Fk		l
8	t	n		g
9	>	/k		
0		{k		

mnkgj.k&1- 80 dks dW/kd ka ea: i kUrj r d j A

gy % 80 3/4 n{k

pj.k 1/2 0 dk dW/kd {k gA

1/4 k 1/2 8 dk dW/kd n gSftl l s l kFkd 'kCn curk gA

1/2 1/2 vr% l kFkd bn{kB 'kCn gA

- /; ku na
 - dñwka dks LFkkuh; eku ds vuq kj fy [kk tkrk gA
 - , d gh l q; k ds vuq 'kCh Hkh cuk, tk l drsgA
 - u d" 5 ds vFkZ eaÁ; "x fd; k tkrk gA

2- o.kk i) fr&bl ea vdk 10 l s 9 rd½ dks 80; at ukk ds rFkk LFkkuh; ekula
 1/2 dks Lojla ds: i ea 0; Dr fd; k tkrk gA
 vk; kV us l l dr dso. kkkjka dks l q; keku ndj , d ubZo. kkd i) fr i Lr
 fd; kA l l dr ds 0; kdj .k ds fu; eka dk mi ; kx dj ds 'n'kxfrdk' ds dby
 , d 'ykd ea gh mlgkus vi uh bl v{kjkd i) fr dks Li"V dj fn; k gS &

oxk{kj.k oxkoxkoxk{kj.k dkr- 3ek% ; %

[k]uods Lojk uo oxkoxk uokR; oxk okAA

bl 'ykd ds vuq kj 25 ox&v{kjka ds eku&

d¼1	t¼8	.k¼15	Q¼22	o¼60
[k¼2	>¼9	r¼16	c¼23	'k¼70
x¼3	¼10	Fk¼17	Hk¼24	"k¼80
?k¼4	V¼11	n¼18	e¼25	l ¼90
¾5	B¼12	/k¼19	; ¼30	g¼100
p¼6	M¼13	u¼20	j¼40	
N¼7	<¼14	i¼21	y¼50	

vš ukS Lojka ds eku&

v	¼1
b	¼100
m	¼10000
—	¼1000000
y`	¼100000000
,	¼10000000000
, s	¼1000000000000
vks	¼10000000000000
vks	¼1000000000000000

- bl v{kjkd i) fr eagLo vš nh?kZ Lojka ea Hkn ughafd; k x; k gA tgka 0; at u ds
 l kFk Loj feyk gvk gSogkal e>uk pkfg, fd 0; at ukd ds l kFk Lojkd dk xqku gvk
 gA tš } f³ ¼ 3- \$ b-¼ 5×100 ¼ 500 dq¼ d-\$ m ¼ 1×10000 ¼ 10000 vš

- t gkal a Ør 0; at u ds l kFk Loj feyk gk\$ ogkal e>uk pkfg, fd og Loj ml l a Ør 0; at u ds i R; d ?kVd ds l kFk feyk gvk gA tS }

$$[k^k \frac{3}{4} \frac{1}{2} k \$ \frac{1}{2} \$ \frac{1}{2} k \$ \frac{1}{2}$$

$$\frac{3}{4} \frac{1}{2} \times 1000000 \frac{1}{2} \$ \frac{1}{2} \times 1000000 \frac{1}{2}$$

$$\frac{3}{4} \quad 82000000$$

- vk; BkV dh i) fr ds vuq kj [; Øk dk eku fuEuor-Kkr dj l drsg&

$$[; Øk \quad \frac{3}{4} \quad [kq \$; q \$?k$$

$$[kq \quad \frac{3}{4} \quad 2 \times 10000 \frac{3}{4} 20000$$

$$; q \quad \frac{3}{4} \quad 30 \times 10000 \frac{3}{4} 300000$$

$$?k \quad \frac{3}{4} \quad 4 \times 1000000 \frac{3}{4} 4000000$$

$$[; Øk \frac{3}{4} 4320000 \frac{1}{4} g l \text{ ; k 1 egk; qk dk eku g\%$$

- 3- 'kCnkad i) fr& bl ea vdkla 10 l s 9 rd½ dks B0; at ukh rFkk dN l [; kvka dks B' kCnkla ¼ kCnkla ds i; k; okph½ ds: i ea 0; Dr fd; k tkrk gA vcl vk\$ mudsfy, iz Ør 'kCn ; sg&

1	&	plnz	6	&	__rq
2	&	us=	7	&	l kxj
3	&	hkpu	8	&	ol q
4	&	on	9	&	xg
5	&	ok.k	10	&	fn'kk

'kCnkad"adk Á; "x djrsqg ØkLdjkk; Zf}rh; Lo; adsckjs eadgrsgfd&

**Bj l xqki wkēghl e 'kdui l e; sØolee"Ui fUkA
j l xqko"Zk e; k fl) Ørf'kj" e.kh jfpr" AA**

½"YW/; k; 13-58½

ejk tle 'kd l ør 1036 ½ l ¾ 6] xqk ¾ 3] i wkZ¾ 0] egh ¾ 1 rFkk v³dkuke-oker" xfr%dsvuq kj½ eagvk Fkk rFkk ešsvi uh vk; qds36oa½ l &xqk½ o"Zlea 'l) Ørf'kj" e.kh xØFk dh jpuk dhA

dVkd dk izsx dj cMk&cMk l [; kvka dks l jyrk l s ; kn j[kus dk rjhdk gekjs _f"k; kþ xf.krKka dh vnHq nsu gA

orZku eadVkd ½dk½ dk iz sx dEl; Wj i tsckfeax] cfdax] l pkj rFkk l suk vkfn vucl {ks=ka eagks jgk gA



Ökx&2

x.kuk dh ijEijkxr fof/k; k

v/; k; &3

oxZ

ge tkursgäfd fdl h I ä; k dksml h I ä; k I sxqkk djusij i klr xqkuQYk ml I ä; k dk oxZgkrk gÅ ; Fkk 6×6 ¾ 36 tks6 dk oxZgÅ 8 × 8 ¾ 64 t" 8 dk oxZgÅ bl sØe'k 6² rFkk 8² fy[krsgÅ

fdl h nh x; h I ä; k dk oxZ Kkr djuk

fdl h I ä; k dk oxZ Kkr djusdh fuEufYkf[kr fof/k; "a dk Á; "x fd; k tkrk gS

1& vkuaq I; sk fof/k

2& I äYku&0; odYkukH; ke fof/k

3& ; konwarkonuhNR; ox±p ; "Tk; r fof/k

4& }U} ; "x fof/k

1&vkuaq I; sk fof/k

bl fof/k dk iz lxx I k/kj .kr-%nksvaladh I ä; k dsoxZdsfy, fd; k tkrk gÅ

iFke idkj $(a+b)^2 = a^2 + 2ab + b^2$ dk iz lxx djdsnksvaladh I ä; k dk oxZ

Kkr djrsgÅ

mÜkj earhu Hkkx cuk, tkursgÅ ngkbZvæd dk oxZI cl sck, aHkkx eafy[krsgÅ chp dsHkkx eabdkbZvkj ngkbZdh I ä; kvæadksxqkk djdsfy[krsgÅ bl h I ä; k dks, d ckj vkj Hkh chp dsHkkx eafy[krsgÅ I cl snkfgusHkkx eabdkbZdh I ä; k dk oxZfy[kk tk I drk gÅ bl fØ; k dksmnkj.k I sl e>Å

mnkj.k 1- % 19² dk eku Kkr dhft, A

gYk % 19² ¾ 1² 1 × 9 9²

$$\frac{3}{4} \quad \frac{1}{1} \quad \frac{1}{8} \quad \frac{1}{8} \quad \frac{3}{4} \quad 361 \text{ mÜkj}$$

i gys Hkkx ¾ck; k; Ökx½ ea ngkbZ vFkkZ-1 dk oxZfy[kk x; k gÅ nÜ js Hkkx

1/e/; Òkx½ ea1 vlsj 9 dksxqkk dj 1×9 fy[kk x; k vlsj ml sml h dsuhpsnøkj fy[kk x; k gA rhl jsHkkx ¼nk; k; Òkx½ eabdkbzdk oxL² fy[kkA vFkkZ-rhl jsHkkx ea81 vk; kA 1 oghajgsk vlsj 8 chp dsHkkx ea tkMæus dsfy, uhps dh vlsj fy[kkA chp dsHkkx ea 9\$9 ¾ 18 gA 8 oghajgsk vlsj 1 dks tkMæus dsfy, uhps j[kkA

f}rh; idkj&bl eangkbz vlsj bdkbz ds vdkæ ea vuqkr Kkr dj ds oxL djus dh fØ; k fuEuor-djrs g&

mngkj.k&1- 41² dk eku Kkr dhft, A

gy %	41 ²	¾	16	4×1	1
				4×1	
	¾	16	8	1	¾ 1681 mÙkj

fØ; kfof/k

- 41² eangkbz vlsj bdkbz dk vuqkr 4 %1 gA
- 1- ngkbz dk oxL ¾ 4² ¾ 16
- 2- 4% ds ifji{; dse/; Hkkx 16@4 ¾ 4
- 3- 4% ds ifji{; ds nk; kaHkkx ¾ 4@4 ¾ 1
- 4- ck; k; Òkx@e/; Òkx@nk; k; Òkx ¾ 16@8@1 ¾ 1681

mngkj.k&2- 64² dk eku Kkr dhft, A

gy %	64 ²	; gk ij	vuqkr	6%	¾	3%
	64 ²	¾	36	24	16	
				24		
	¾	36	48	16	¾ 4096 mÙkj	

64 ds ngkbzo bdkbz ds vdkæ 6 o 4 dk vuqkr 3% gS bl fy, chp ds Hkkx dsfy, 36 ea 3 l sHkkx vlsj 2 l sxqkk djus ij 24 iklr gkskA bl h idkj nk; kaHkkx 24 ds ifji{; ea 16 iklr gkskA

mngkj.k&3- 91² dk eku Kkr dhft, A

gy %	91 ²	¾	81	9	1
				9	
	¾	81	8	1	¾ 8281

mngkj.k&4- 37² dk eku Kkr dhft, A

gy %	37 ²	¾	9	21	49
				21	
	¾	13	6	9	¾ 1369

mnkgj .k&5-	34 ² ¾ 9,4,6	¾	1156
mnkgj .k&6-	48 ² ¾ 16,4,4	¾	2304
mnkgj .k&7-	63 ² ¾ 36,6,9	¾	3969

2- I d y u & 0 ; o d y u h ; k e ~

bl I = dk vFlZgStkMej vKj ?kVkdjA 'k; k; r %og I ; k ftI dh bdkbZ'k; g^{1/2} I ; k I s , d de ; k , d vf/kd I ; k dk oxZbl fof/k I svkl kuh I sfudkyk tk I drk gA bl h idkj ; fn fdl h I ; k dk oxZeky gk r ml I ; k I s , d de ; k , d vf/kd I ; k dk oxZHkh bl fof/k I s Kkr fd ; k tk I drk gA

mnkgj .k&1- 20² ¾ 400 dh tkudkj h I s 19 vKj 21 ds oxZ Kkr djA

gYk% I ; k 20 I s 19 , d de gS vKj 21 , d vf/kd gA

- vr%19² ¾ 20² & 20 & 19 ¾ 361

pfid ; gk I ; k 19] 20 I s 1 de gA vr%19² Kkr djus ds fy, 20² eal sigys 20 fQj 19 ?kV; ; s D ; fid 1/2 & 1 1/2 ¾ 1/2 & 20 & 20 \$ 1 1/2 ¾ 1/2 & 20 & 19 1/2

- 21² ¾ 20² \$ 20 \$ 21 ¾ 441

∴ 1/20 \$ 1 1/2 ¾ 1/20² \$ 20 \$ 20 \$ 1 1/2 ¾ 1/20² \$ 20 \$ 21 1/2

pfid ; gk I ; k 21] I ; k 20 I s 1 vf/kd gA vr%21² Kkr djus ds fy, 20² eal sigys 20 fQj 21 tkMxA

- **ftu I ; k v l a d s b d k b Z d s v a l 5 g l a r k s , d h I ; k v l a d k o x Z f u f u o r - K k r d j r s g &**

bl ds fy, n^o 0kx 1nk ; k; 0kx o ck ; k; 0kx 1/2 Kkr djrs gA

nk ; ka Hkkx ¾ 5² ¾ 25

ck ; ka Hkkx ¾ bdkbZ dks NkMej 'kSk cph I ; k , o a m l I s , d c Mh I ; k dk xquQyA

25² ¾ 2 1/2 \$ 1 1/2 @ 25

¾ 2 × 3 @ 25

¾ 625

65² ¾ 6 × 7 @ 25

¾ 4225

125² ¾ 12 1/2 \$ 1 1/2 @ 25

¾ 12 × 13 @ 25

¾ 15625

- **, d h I ; k , i f t u d k b d k b Z d k v a l 1 g l s d k o x Z f u f u o r - K k r d j r s g &**

nk; k; Hkx	¾	1	
ck; k; Hkx	¾	¼ d; k\$1½ × ngkbl dk vrd	
tS & 11²	¾	¼1\$1½ × 1 @1	
	¾	121	
21 ²	¾	¼2\$1½ × 2 @1	
	¾	441	
51 ²	¾	¼5\$1½ × 5 @1	
	¾	2601	
121 ²	¾	¼12\$1½ × 12 @1	
	¾	14641	

mnkgj.k&2- I rdYku 0; kodYkukH; ke-fof/k I s24 o 26 dk oxZ Kkr djA

gYk %: ge 25² dk eku tkursg&

25 ²	¾	2×3@5×5	¾	625	
vr%	26 ²	¾	625\$25\$26	¾	676
v ^g	24 ²	¾	625&25&24	¾	576

mnkgj.k&3- 195 dk oxZ Kkr djA bl dh I gk; rk I s194 v^g 196 dk oxZ Kkr djA

gy %	195 ²	¾	19×20@5 ²	¾	38025		
	194 ²	¾	38025&195&194	¾	37636		
	196 ²	¾	195 ² \$195\$196	¾	38025\$391	¾	38416

3- ; konua rkonuhNR; ox± p ; Tk; r fof/k

bl I wk dk ; g vFkZgsfd I d; k ¼tI dk oxZ Kkr djuk g& vk/kkj I sftruh de ; k vf/kd g] ml I d; k I smruk de ; k vf/kd dj bl ea oxZ dh Oh ; tuk djA ; g fØ; k n Òkx a eag rh gA pkgack; a I snk; a ; k nk; a I sck; a dj I drs gA

mnkgj.k 1 %7² dk eku Kkr djA

gYk& ; gk I d; k 7 dsfYk, vk/kkj 10 Y'axA

vk/kkj 10 I s I d; k 7 dk fopYku	¾	7&10	¾	&3	gA		
vr%ck; k; Òkx		¾	7&3	¾	4		
nk; k; Òkx		¾	¼&3½	¾	9		
	7 ²	¾	7&3 @¼&3½	¾	4@9	¾	49 mÙkj

mnlkj.k 2 %11² dk eku crkb, A

gYk& vk/kkj 10 Y`us ij fopYku $\frac{3}{4}$ 11&10 $\frac{3}{4}$ 1 gA
vr%11² $\frac{3}{4}$ 11 + 1@ $\frac{1}{4}$ $\frac{1}{2}$ $\frac{3}{4}$ 12@1
 $\frac{3}{4}$ 121

mnlkj.k 3 %41² dk eku crkb, A

gYk % vk/kkj 40 Y`us ij fopYku $\frac{3}{4}$ 41&40 $\frac{3}{4}$ +1
vr%41² $\frac{3}{4}$ 4 $\frac{1}{4}$ 1 + 1 $\frac{1}{2}$ @1² $\frac{3}{4}$ 4 $\frac{1}{4}$ 2 $\frac{1}{2}$ @ 1²
 $\frac{3}{4}$ 1681

; gk; vk/kkj 40 gSt` vk/kkj 10 l s4 xpk gA vr%ck; aOkx ea4 l s xqkk fd; k
x; k gA

vk/kkj 50 Y`us ij 41² dk eku fuEuor~Kkr djxs

bl fLFkr ea fopYku $\frac{3}{4}$ 41&50 $\frac{3}{4}$ &9
41² $\frac{3}{4}$ 5 $\frac{1}{4}$ 1&9 $\frac{1}{2}$ @ $\frac{1}{2}$ &9 $\frac{1}{2}$ $\frac{1}{4}$ vk/kkj 50 Y`us ij 5 l s xqkk $\frac{1}{2}$
 $\frac{3}{4}$ 5 \times 32@81 $\frac{3}{4}$ 160@ $\frac{1}{8}$ $\frac{3}{4}$ 1681

mnlkj.k 4 %64² $\frac{3}{4}$ 6 $\frac{1}{4}$ + 4 $\frac{1}{2}$ @4² $\frac{3}{4}$ 408@ $\frac{1}{6}$ $\frac{3}{4}$ 4096

mnlkj.k 5 %34² $\frac{3}{4}$ 3 $\frac{1}{8}$ 4 + 4 $\frac{1}{2}$ @4² $\frac{3}{4}$ 114@ $\frac{1}{6}$ $\frac{3}{4}$ 1156

mnlkj.k 6 %988² $\frac{3}{4}$ 988 & 12@ $\frac{1}{8}$ &12 $\frac{1}{2}$ $\frac{3}{4}$ 976@144 $\frac{3}{4}$ 976144

mnlkj.k 7 %1112² $\frac{3}{4}$ $\frac{1}{4}$ 112 + 112 $\frac{1}{2}$ @112² $\frac{3}{4}$ 1224@ $\frac{1}{4}$ 12 + 12 $\frac{1}{2}$ @12²

$\frac{3}{4}$ 1224@124@ $\frac{1}{4}$ 4

$\frac{3}{4}$ 1224@ $\frac{1}{12}$ 5@44

$\frac{3}{4}$ 1236@544

$\frac{3}{4}$ 1236544

4- }U} ; kx fof/k

l o`Eke ge nh x; h fd l h l $\frac{1}{4}$; k dk }U} ; kx djuk l h[kaxA

$\frac{1}{4}$ $\frac{1}{2}$,d val dh l $\frac{1}{4}$; k dk }U} ; kx ml l $\frac{1}{4}$; k dk oxL gkrk gA t\$ s 2 dk
}U}; kx $\frac{3}{4}$ 2² $\frac{3}{4}$ 4] 7 dk }U}; kx $\frac{3}{4}$ 7² $\frac{3}{4}$ 49

$\frac{1}{2}$ $\frac{1}{2}$ nksvaladh l $\frac{1}{4}$; k dk }U}; kx nksuka valka dks xqkk dj ds nks xpk djus ij
feyrk gA t\$ } 13 dk }U}; kx $\frac{3}{4}$ 2 \times $\frac{1}{4}$ \times 3 $\frac{1}{2}$ $\frac{3}{4}$ 6]

47 dk }U}; kx $\frac{3}{4}$ 2 \times $\frac{1}{4}$ \times 7 $\frac{1}{2}$ $\frac{3}{4}$ 56

$\frac{1}{8}$ $\frac{1}{2}$ rhu valadh l $\frac{1}{4}$; k dk }U}; kx igyh vk\$ vlure l $\frac{1}{4}$; k dks xqkk dj ds nks
xpk djus vk\$ ml ea chp dh l $\frac{1}{4}$; k dk oxL tkMus l sikr gkrk gA t\$ }

145 dk }U}; kx $\frac{3}{4}$ 2 \times $\frac{1}{4}$ \times 5 $\frac{1}{2}$ \$ 4² $\frac{3}{4}$ 10\$16 $\frac{3}{4}$ 26]

367 dk }U}; kx $\frac{3}{4}$ 2 \times $\frac{1}{8}$ \times 7 $\frac{1}{2}$ \$6² $\frac{3}{4}$ 42 \$ 36 $\frac{3}{4}$ 78

$\frac{1}{4}\frac{1}{2}$ **pkj valkadh I ĩ; k dk }U};** kx Kkr djus dsfyk, igyh vĳ pkĳkh I ĩ; k ds }U}; kx eanĳ jh vĳ rhĳ jh I ĩ; k dk }U}; kx d" t"MrsgA tŒ & $\frac{1}{4}\frac{1}{2}$ 1346 dk }U}; kx $\frac{3}{4}$ $2 \times \frac{1}{4} \times 6\frac{1}{2}$ \$ $2 \times \frac{1}{8} \times 4\frac{1}{2}$
 $\frac{3}{4}$ 36
 $\frac{1}{4}$ vĳ 6 dk }U}; "x $\frac{1}{2}$ \$ $\frac{1}{8}$ vĳ 4 dk }U}; "x $\frac{1}{2}$ $\frac{1}{2}\frac{1}{2}$ 5007 dk }U}; kx $\frac{3}{4}$ $2 \times \frac{1}{5} \times 7\frac{1}{2}$ \$ $2 \times \frac{1}{10} \times 0\frac{1}{2}$ $\frac{3}{4}$ 70

$\frac{1}{5}\frac{1}{2}$ **ikp valkadh I ĩ; k dk }U};** kx $\frac{3}{4}$ igysvĳ ikpoavĳ dh I ĩ; kvkadk }U}; "x \$ nĳ jsvĳ pkĳksvĳ dh I ĩ; kvkadk }U}; "x \$ rhĳ jsLFkku dh I ĩ; k dk }U}; "x tŒ s31406 dk }U}; "x $\frac{3}{4}$ $2 \times \frac{1}{8} \times 6\frac{1}{2}$ \$ $2 \times \frac{1}{4} \times 0\frac{1}{2}$ \$ 4²
 $\frac{3}{4}$ 36 \$ 0 \$ 16 $\frac{3}{4}$ 52
 bl h iĳkj 5 vĳ"al scMĳ I ĩ; kvkadk }U}; kx Oh Kkr fd; k tk I drk gA

}U}; kx I s oxZ Kkr djuk

$\frac{1}{d}\frac{1}{2}$ ftI I ĩ; k dk oxZekyĳ djuk gŒml eanĳfguh vĳ I s, d&, d c<rh gĳZ vĳ fQj , d , d ?Kvrh gĳZ I ĩ; k ea vĳ yĳj I eĳ cukrs gA tŒ &
 31 ds vĳ I eĳ $\frac{3}{4}$ 3] 31] 1
 465 ds vĳ I eĳ $\frac{3}{4}$ 4] 46] 465] 65] 5
 2346 ds vĳ I eĳ $\frac{3}{4}$ 2] 23] 234] 2346] 346] 46] 6

/; ku na fd fdl h I ĩ; k ds oxZ grĳ }U}; kx ds fy, cuk, vĳ I eĳka dh fxurh nh gĳZ I ĩ; k ea vĳka dh fxurh ds nks xqis I s, d de gkrh gA
 $\frac{1}{4}$ $\frac{1}{2}$ ftI I ĩ; k dk oxZ Kkr djuk gkrĳ gŒ I oĀFke mDrkuĳ kj I eĳ cuk Y"rs gŒ ft rus I eĳ curs gŒ oxZeamrusgh [k.M gĳks vĳ iR; d [k.M eamĳ [k.M dsl x r dsl eĳ dk }U}; kx Kkr dj ds fyk [krsgA ; g I fØ; k nĳfguh ; k ckbĳ vĳ I sgks I drk gA

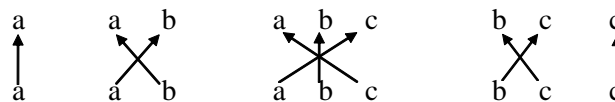
mnkgj.k&1- 31² dk eku }U}; kx I s Kkr dhft, A
fØ; k %I oĀFke 31 ds vĳ I eĳ Kkr dj rsgA 31 ds vĳ I eĳ 3] 31] 1
 bu I eĳ"ad" }U}; "x fuEuor-Kkr dj rsg&
 3 dk 3² $\frac{3}{4}$ 9
 31 dk $2 \times \frac{1}{8} \times 1\frac{1}{2}$ $\frac{3}{4}$ 6
 1 dk 1² $\frac{3}{4}$ 1
 vr%31² $\frac{3}{4}$ 3²@ $2 \times \frac{1}{8} \times 1\frac{1}{2}$ @1² $\frac{3}{4}$ 961

mnkgj.k&2- 64^2 dk eku }U}; kx l s Kkr dhft, A
fØ; kfof/k % $64^2 \frac{3}{4} 6^2 @ 2 \times 6 \times 4 @ 4^2 \frac{3}{4} 36 @ \frac{8}{4} @ \frac{6}{4} \frac{3}{4} 4096$
 $\frac{1}{4}$ eg 6] 64] $4\frac{1}{2}$

rhu vadh I ; kvads oxZ

rhu vad dh I ; k dk oxZ Kkr d jus ds fy, l o Afke vad l eg Kkr d jrsg ; gk ij dYk 5 vad l eg cu xA i k p avad l eg dk }U}; "x Kkr d jrsg dYk l x r i k p Øk x a e a }U}; "x fyk [kdj oxZ Kkr d jrsg ; fn rhu vad dh d bZ l ; k abc g r &

$$(a + b + c)^2 = a^2 + 2ab + 2ac + b^2 + 2bc + c^2$$



mnkgj.k&3- 345^2 dk eku }U}; "x fof/k l scrkb, A
gYk % 345 dk vad l eg $\frac{3}{4}$ 3] 34] 345] 45] 5
 vr% $345^2 \frac{3}{4}$ 3 dk }U}; "x @ 34 dk }U}; "x @ 345 dk }U}; "x @ 45 dk }U}; "x @
 5 dk }U}; "x
 $345^2 \frac{3}{4} 3^2 @ 2 \times 18 \times 4 \frac{1}{4} @ 2 \times 18 \times 5 \frac{1}{4} @ 4^2 @ 2 \times 14 \times 5 \frac{1}{4} @ 5^2$
 $\frac{3}{4} 9 @ \frac{4}{2} @ \frac{6}{4} @ \frac{0}{4} @ \frac{5}{2} \frac{1}{4}$ eg 3] 34] 345] 45] $5\frac{1}{2}$
 $\frac{3}{4} 119025$

fØ; kfof/k% $\frac{1}{4}$ rhu vad g] $3 \times 2 \times 1 \frac{3}{4} 5$ vad l eg cu x s f t u d s }U}; k x k a d k s Ø e ' k %
 fy [k u s d s f y, i k p l f k k u p k f g, A
 $\frac{1}{2}$ fØ; k n k f g u h v k j l s d j u s l s e k s [k d : i l s l h / k s g h m Ø k j f y [k k t k
 l d r k g ; g b l r j g g k s l d r k g
 $5^2 \frac{3}{4} 25$ dk 5] gkFk ea 2
 $\frac{1}{8}$ 45 dk }U}; kx $2 \times 4 \times 5 \frac{3}{4} 40$ ea 2 tkM us ij 42 dk 2] gkFk ea 4
 $\frac{1}{5}$ 345 dk }U}; kx $\frac{3}{4} 30 @ 16 \frac{3}{4} 46$ ea 4 tkM us ij 50 dk 0] gkFk ea 5
 $\frac{1}{6}$ 34 dk }U}; kx 24 ea 5 tkM us ij 29 dk 9] gkFk ea 2]
 $\frac{1}{7}$ 3 dk }U}; kx 9] bl ea 2 tkM us ij 11(mØkj $\frac{3}{4} 119025$

/; ku n&

$$(a+b+c)^2 = a^2+b^2+c^2+2ab+2bc+2ca$$

$$(a+b+c)^2 = a^2+ 2ab+(2ac+b^2)+2bc+c^2 \quad ds : i \text{ ea gh mDr fØ; k dh x; h g}$$

mnkgj.k&4-	1403 ² dk eku }U}; "x fof/k l sKkr djA
gYk %	1403 dk vđ l eŋ ¾ 1] 14] 140] 1403] 403] 03] 3 1403 ² ¾1 ² @2¼1×4½@0\$4 ² @2¼1×3½\$0@2¼1×3½\$0@0@3 ² ¾ 18,66,409 ¾ 1968409
mnkgj.k&5-	34106 dk oxL }U}; ksx fof/k l sKkr djA
gYk %	34106 dk vđ l eŋ ¾ 3] 34] 341] 3410] 34106] 4106] 106] 06] 6 34106 ² ¾ 9@ ₂ 4@2½×1½\$4 ² @2½×0\$4×1½@2½×6\$4×0½\$1 ² @ 2¼×6\$0×1½@2¼×6½@2×0×6@6 ² ¾ 11@4@ ₂ 2@8@ ₃ 7@ ₄ 8@ ₁ 2@0@ ₃ 6 ¾ 1163219236

chtxf.kr ea }U}; ksx dk iz ksx

mnkgj.k %	$(3x^2+4x+2)^2$ dk eku Kkr djA
gYk %	dxs10 dsl eku ekuusij 3 l dMh 4 ngkbzvš 2 bdkbzdsl eku ekuk tk l drk gA vr% l eŋ bl izdkj cuakA 3] 34] 342] 42] 2 buds }U}; ksx x ds?kkrka dsl kFk yusij $\frac{1}{8}x^2+4x+2\frac{1}{2}\frac{1}{8}x^2\frac{1}{2} + 2 \times (3x^2 \times 4x) + \{2(3x^2 \times 2) + (4x)^2\} + 2(4x \times 2) + 2^2$ $= 9x^4 + 24x^3 + 28x^2 + 16x + 4$ /; ku nŋ vđ l eŋ 5 gA vr% x ds?kkr 4 l s0 rd dŋy ikp gkA

vH; kl

1-	vkuq l; sk fof/k l soxL fudkyA ¼d½ 14] 16] 28] 46] 66] 96 ¼[k½ 122] 412] 624
2-	}U}; ksx fof/k l soxL fudkyA ¼d½ 23] 25] 34] 42] 56 ¼[k½ 153] 235] 435] 2345] 4236
mŋkjekYkk	
1-	¼d½ 196] 256] 784] 2116] 4356] 9216 ¼[k½ 14884] 169744] 389376
2-	¼d½ 529] 625] 1156] 1764] 3136 ¼[k½ 23409] 55225] 189225] 5499025] 17943696



v/; k; &4 oxëw

iwkoxZ I ð; k dk oxëw Kkr djuk&

- (i) pfd 1² ¾ 1 rFkk 9² ¾ 81] vr%, d vð dh I ð; k dk oxZ, d ; k n" vð"adk g"xA
- (ii) 10² ¾ 100 rFkk 99² ¾ 9801] vr%n" vð"adh I ð; k dk oxZrhu ; k pkj vð"adk g"xA
- (iii) 100² ¾ 10000 rFkk 999² ¾ 99800A vr%rhu vð"adh I ð; k dk oxZ i kp ; k N%vð"adk g"xA
- (iv) bl h Ádkj vkxs dh I ð; kv"ads oxZea vð"adh I ð; k Kkr dh tk I drh gA vr%I ð; k ds vðkadsn[kdj oxëw fdrusvðkadh I ð; k gkxh ; g Kkr fd; k tk I drk gA

pkj vðkard dh iwZ oxZ I ð; k dk oxëw&

budk oxëw foykdue-fof/k I s Kkr fd; k tk I drk gA fuEu I kj.kh nð[k&

I ð; k &	1	2	3	4	5	6	7	8	9	10
oxZ &	1	4	9	16	25	36	49	64	81	100
chtkað &	1	4	9	7	7	9	4	1	9	1

viwZ oxZ I ð; k dh igpku&

- ¼½ oxZ I ð; k dh bdkbz ea1] 4] 5] 6] 9 vFkkZr~1] 4] 5 ; k budh i je fe« ¼10 dh ij d½ I ð; k gh gA vr%; fn I ð; k d" bdkbz ea2] 3 vFkok buds i je fe« ¼¼ ij d½ 7] 8 gkarks og I ð; k iwkbxZ ugha gA t\$ s17] 102] 123 vkfn iwZ oxZ I ð; k ugÉ gA
- ½½ I ð; k dk chtkað 1 I s9 rd gks I drk gA I kj.kh I soxZ I ð; k dk chtkað 1] 4] 7] 9 ea I s dkbz gA vr%chtkað 2] 3] 5] 6 ; k 8 gks rks og I ð; k iwkbxZ ugha gA
- ¾¾ oxZ I ð; k ds vUr ea'kt; "adh I ð; k I e vFkkZr~n" pkj] N%vkfn g" I drsgA ; fn I ð; k ds vUr ea'kt; "adh I ð; k fo"ke vFkkZr~, d ; k rhu ; k i kp gkarks og I ð; k iwkbxZ ugha g" I drh gA t\$ s1000] 25000 vkfn iwZ oxZ ugha gA vFkkZr~ I ð; k iwZ oxZ ugha gkxh ; fn&

- 1/4 1/2 bl dh bdkbz dk vrd 2] 3] 7] 8 gkA
- 1/2 1/2 bl ds vlr ea 'k; "a dh l ; k fo"ke g"A
- 1/3 1/2 bl dk bdkbz dk vrd 6 gk; i jlrqngkbz dk vrd l e 10]2]4]6]8 1/2 gkA
- 1/4 1/2 bl dk bdkbz dk vrd 1] 4] 5 ; k 9 gk i jlrqngkbz dk vrd fo"ke 1/1] 3] 5] 7] 9 1/2 gkA
- 1/5 1/2 ; fn l ; k l e g; v; bl ds vlrre nks vrd 1/2 bdkbz o ngkbz 4 l s foHkfrtr ugha gkA
- 1/6 1/2 l ; k dk bdkbz dk vrd 5 gk v; ngkbz ea 2 ugha gkA

i woxl l ; k dsoxey dk ngkbz dk vrd Kkr djuk foykdue-fof/k l s ngkbz dk vrd l jyrk l s kkr fd; k tk l drk gA pfd 8 dk oxl 64 v; 9 dk 81 gA vr%6400 l s 8099 rd dh l ; k dsoxey eangkbz vrd 8 gkskA ngkbz vrd fdruk gsk; g Kkr djusdsfy, ck; al enj dk fudV oxey Kkr djuk gh i ; klr gA

i woxl l ; k ds oxey dk bdkbz vrd Kkr djuk ; g Hkh foykdue-fof/k l s kkr fd; k tk l drk gA Li"V gsf

oxl l ; k dk pjekd 1/2 bdkbz	oxey dk pjekd 1/2 bdkbz
1	1 ; k 9
4	2 ; k 8
5	5
6	4 ; k 6
9	3 ; k 7

bl fof/k l s iklr oxey dspjekd ijLij ijefe= 1/10 ds ijd 1/2 gA nksuka ea l s dksu & l k pjekd l gh gsb l s tkuus ds fyk, , dkf/kdsu i wsk fof/k dk mi ; "x djrsgA

mnkgj.k&1- 5184 dk oxey Kkr dhft, A

gYk %d 1/2 nkfguh v; l snk&nks vrd ads tkM/s cuk, A igyk tkMk 84 v; nl jk 51 gA ck; hav; dk tkMk 51 dk fudVre oxey 7 gkskA vr%ngkbz vrd 3/4 7

1/4 k 1/2 i woxl l ; k dk pjekd 4 gA vr%oxey dk bdkbz vrd 2 ; k 8 gkskA vr%oxey 72 ; k 78 gkskA

1/2 k 1/2 , dkf/kdsu i wsk l = dsiz kx l s 72 , oa78 dse/; l ; k 75 dk oxl 5625 g; pfd l ; k 5625 l snh x; h l ; k 5184 N"Vh g; vr% l ; k 5184 dk oxey 72 gkskA

mnkgj .k&2 iwkbxZl I ; k 6084 dk oxëWk crkb, A
gYk % ¼½ I ; k 6084 dk n'&n" vñ'adk t"Mt cukus ij 60 v¶ 84 g¶kA
 ck; È v'j dk t"Mt 60 g¶ bl dk fudVre oxëWk ¾ 7A vr%ngkbZdk
 vñ ¾ 7
 ½½ nh x; h iwLxZl I ; k dk pjekñ ¼bdkb½ 4 gSvr%oxëWk dh bdkbZ
 dk vñ 2 ; k 8 g'xkA vr%oxëWk 72 ; k 78 g'xkA
 ¼½ 72 ,oa 78 dse/; I ; k 75² ¾ 5625 g¶ nh x; h iwkbxZl I ; k 5625 I s
 cMt gSvr%oxëWk 78 gkskA

mnkgj .k&3 iwkbxZl I ; k 3249 dk oxëWk fudkfy, A
gy& ¼½ ck; k; tKt 32 dk fudVe oxëWk 5A vr%ngkbZ¾ 5
 ½½ oxZl I ; k dh bdkbZ 9 gSvr%oxëWk dh bdkbZ dk vñ 3 ; k 7 g'xkA
 ¼½ oxëWk 53 ; k 57 gkskA
 ¼½ 55² dk oxZl 3025 I snh x; h iwLxZl I ; k cMt g¶ vr%oxëWk 57 gkskA

/; ku na
 ¼½ I ; k dspjekñ dsfoykdue-I soxëWk dk bdkbZ vñ iklr gsrk g¶
 I Hkkfor bdkbZ vñ nks gks I drsg¶
 ½½ I ; k dspjekñ oksy tKt s I soxëWk dh bdkbZ dk vñ Áklr gsrk g¶ 'kSk
 vñka I snh jk tKt curk g¶
 ¼½ nih s tKt dsfoykdue-I soxëWk dk ngkbZ vñ iklr gsrk g¶
 ¼½ ngkbZ vñ v¶ bl ds, dkf/kd dk xqkuQy fudkya I ; k dk nih jk tKt
 bl xqkuQy I s Nk/k gksrks bdkbZ dsfy, Nk/k vñ ppa v¶ cMt gksrks
 bdkbZ dsfy, cMt vñ ppa
 ¼½ ge tkurs g¶fd bdkbZ vñ 5 okyh I ; k dsoxZ dk iwLHkkx ngkbZ vñ
 v¶ bl ds, dkf/kd dk xqkuQy gsrk g¶ vr%foykdue-I s; g tkudkj h
 iklr gsrh gSfd I ; k dsoxëWk dh bdkbZ 5 I s de gS; k vf/kd g¶

vH; kl

fuEufyf[kr iwLxZl I ; kvka dk foykdue-fof/k I soxëWk Kkr dhft, &

¼½	361	½½	841	¾¾	529	¼½	289
¼½	9409	¼½	7569	¼½	8281	¼½	7744

mÜkjekYkk

¼½	19	½½	29	¾¾	23	¼½	17
¼½	97	¼½	87	¼½	91	¼½	88

N% vølkard dh iwl oxZ I ð; k dk oxëy Kkr djuk

ppid ge tkursgðfd ikp ; k N% vølkard iwl oxZ I ð; k dk oxëy rhu vølkard
dh I ð; k gksxA bl ea I ð; k dh nkfguh vktj I snk&nksvølkard s tkMscukrs gA
bl earhu tkMscukA ikp vølkard Nk/h I ð; k gksrksvud ckj I ðM; g tkj
rFkk nl g tkj ds vølkard , d gh I eng cukdj foyksue-}kjk ngkbZ vktj I ðM;
dk LFkku iklr dj yrs gA I ð; k cM; gksusij oxëy ds bdkbZ dk vød rFkk I cl s
ck; havtj ds tkM; s I ðM; dk vød rks i wZ dh Hkkfr Kkr djrs gA chp dk vød
vFkkfr-ngkbZ dk vød Kkr djuk I h[kuk gksxA bl sfuEufYkf[kr mnkgj .k' a I s
I e>k tk I drk gA

mnkgj .k&1- iwl oxZ I ð; k 12769 dk oxëy Kkr dhft , A

gYk % $\sqrt{12769}$ $\frac{3}{4}$ 113 vFkok 117 $\frac{1}{4}$ EHkkfor mUkj $\frac{1}{2}$
 $\frac{3}{4}$ 113 $\frac{1}{4}$ gh mUkj $\frac{1}{2}$

$$\left[\begin{array}{l} \because 11 \times 12 = 132 \\ rFkk 127 < 132 \end{array} \right]$$

vr% Nk/h I ð; k 113 gh I gh mRrj gA

0; k[; k%

$\frac{1}{4}$ nkfguh vktj I snk&nksvølkard s tkMscuk; A igyk tkM; 69 gA nl js vktj
rhl js tkM; ds foykdj nl jk I eng 127 cuk yA
 $\frac{1}{4}$ ck; havtj dk I eng 127 gA I eng dh I ð; k $11^2 \frac{3}{4}$ 121 vktj $12^2 \frac{3}{4}$ 144 ds
e/; gA vr% bl I eng I soxëy dk ck; havtj dk fgLI k '11' iklr gA
 $\frac{1}{4}$ pjekd 9 gA vr% oxëy dk bdkbZ dk vød 3 ; k 7 gksxA vr% I EHkkfor
oxëy 113 vFkok 117 gksxA
 $\frac{1}{4}$, dkf/kd I # dk iz ks dj i wZ vød 11 vktj bl dk , dkf/kd vFkkfr-12
dk vki I ea xqkk djus I s 132 xqkuQy vkrk gA ppid 127 < 132 I s
vr% foykdue- I s Kkr gkrk gSfd Nk/h I ð; k 113 gh I gh mUkj gA

mnkgj .k&2- iwl oxZ I ð; k 552049 dk oxëy Kkr dhft , &

gYk % $\sqrt{552049}$ $\frac{3}{4}$ 7 n- b- I s n- b-
* 3 ; k 7 * 7

ngkbZ vød Kkr djus gA

$[55 - 49 = 6; 62 \div 14 = 4 \text{ } \frac{1}{4} \text{udVre} \frac{1}{2}]$

$\frac{3}{4}$ 743 ; k 747

$\frac{3}{4}$ 743 mUkj

$$\left[\begin{array}{l} 74 \times 75 = 5550 \\ 5520 < 5550 \end{array} \right]$$

fØ; kfof/k&

- ¼d½ bl earhu tkM+cu&A igyk tkMk 49] nñ jk 20 rFkk rhl jk tkMk 55 gks&kA
- ¼[k½ rhl js tkM+55 dk fudVre ox&ny 7 gSvr%ox&ny dk I sM+dk v&d 7 i klr g&rkA
- ¼x½ rhl js tkM+55 eabl v&d 7 dk oxZvFkkZ-49 ?kVkus ij 6 'k&sk c&pk] bl s nñ js tkM+20 ds&ck; hav&kj okysv&d 2 ds&ck; hav&kj fy[kus I su; k HkkT; 62 i klr fd; kA ox&ny ds I sM+dsv&d 7 dk n&uk ¾ 14 Áklr dj&ks; gh Hkktd g&A 62 ÷ 14 I sHkkxOy ¾ 4 ¼fudVre%A
- ¼k½ pjek&d 9 g&A vr%ox&ny dk b&kbZdk v&d 3 ; k 7 gks&kA I Hkkfor ox&ny 743 ; k 747 g&A
- ¼³½ , dkf/kd I = dk iz k&x dj i dZ I & ; k 74 vk&j bl dk , dkf/kd vFkkZ-75 dk vki I e&xqkk djus I s'5550* feyrk g&A vr%Nk/h I & ; k 743 gh I gh m&lkj g&A p&fd nh x; h I & ; k 5520 < 5550

vH; kI

fuEufyf[kr i wkZoxZ I & ; kv&ka dk foy&due-fof/k I sox&ny Kkr dhft , &

¼1½ 16384	¼2½ 20736	¼3½ 42849	¼4½ 45369
¼5½ 48841	¼6½ 119716	¼7½ 294849	¼8½ 804609
¼9½ 996004	¼10½ 992016		

m&lkj ekYk

¼1½ 128	¼2½ 144	¼3½ 207	¼4½ 213
¼5½ 221	¼6½ 346	¼7½ 543	¼8½ 897
¼9½ 998	¼10½ 996		



v/; k; &5

?ku

ge tkursgáfd fdl h nh x; h l á; k d" vki l earhu ckj xqkk djusij n" l á; k Áklr g"rh gš ml sml l á; k dk ?ku dgrsgá mnkgj .kkfk&

$$2^3 \frac{3}{4} 2 \times 2 \times 2 \frac{3}{4} 8$$

$$5^3 \frac{3}{4} 5 \times 5 \times 5 \frac{3}{4} 125$$

$$10^3 \frac{3}{4} 10 \times 10 \times 10 \frac{3}{4} 1000$$

bl h Ádkj vU; l á; kv"ads?ku Kkr fd; s tk l drsgá

fdl h nh x; h l á; k dk ?ku Kkr djusdsfYk, fuEufYkf [kr fof/k; k; g&

1- vkuq l; sk fof/k

2- ; konwarkonuhÑR; oxþ ; "t; r-fof/k

3- vku#l; skj ; konwarkonuhÑR; oxþp ; "t; r-fof/k

1- vkuq l; sk fof/k

bl fof/k l sftl l á; k dk ?ku fudkyuk gksog l k/kkj .kr%nksvækdh gkuh pkfg, A ge tkursgáfd $(a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$ mÚkj ds fy; s pkj [k.M gkrs gá nkguh vkj l sbueaØe' k% mÚkj dh bdkb] ngkb] l fdlMsvkj 'kSk ds væd vkrs gá l wk vkuq i sk dk vFkZ gS^vuijkr ds }kj k^

mnkgj .k&1- 21³ dk eku Kkr dhft, A

gy& 21 ³ $\frac{3}{4}$	2 ³	4	2	1 ³
		8	4	
<hr/>				
	8	12	6	1

$$\frac{3}{4} 8 @ 12 @ 6 @ 1 \frac{3}{4} 8 @ 2 @ 6 @ 1 \frac{3}{4} 9261$$

fØ; kfof/k&

$\frac{1}{4} \frac{1}{2}$ l cl sck; aØkx ea ngkbZ ds væd 2 dk ?ku $\frac{3}{4} 2^3$

nl js Hkkx ea $\frac{1}{2}$ ngkbZ væd $2\frac{1}{2} \times \frac{1}{2}$ dkbZ væd $\frac{1}{2} \frac{3}{4} \frac{1}{2} \times 1\frac{1}{2} \frac{3}{4} 4$

rhl js Hkkx ea $\frac{1}{2}$ ngkbZ væd $1\frac{1}{2} \times \frac{1}{2}$ dkbZ væd $\frac{1}{2} \frac{3}{4} \frac{1}{2} \times 1\frac{1}{2} \frac{3}{4} 2$

vflure pkfIs Hkkx ea $\frac{1}{2}$ dkbZ væd $\frac{1}{2} \frac{3}{4} 1^3$ fy [kdj tkMk&

1/2½ chp okY" n"u"LFkku"adsuhpsml I ð; k dh n" xqk I ð; k fYk[kdj t"MaA
 /;ku n& 1- iR; d Hkkx ea, d gh vð jg I drk gA vfrfjDr vð ckbãvkj
 tkM/tkrsgA I cl sckbãvkj dsHkkx ea, d I svf/kd vð Hkh jg
 I drsgA
 2- I cl sc k; a Òkx ea ngkbl ds vð 2 dk ?ku fYk[kdj bdkbl vuij kr
 ngkbl¾ 1@2 dk xqkk djrsgq vñre p" LFkku rd fYk[kusdh fØ; k
 dj e/; Òkx"aean" xqk t"Mej Òh A' u gYk dj I drsgal wk&vku#I; sk
 dk vFkZ vuij kr ds jkjk gA

mnkgj .k&2- 12³ dk eku Kkr dhft , A

gYk %	12 ³ ¾	1 ³	2	4	8
			4	8	
	1	6	12	8	
	¾	1728			

fØ; kfof/k&

¼½ ngkbl vð 1³ ¾ 1

1/2½ $\frac{bdkbl}{ngkbl} \frac{2}{¾} \frac{¾}{1}$ vuij kr dk xqkk djrsgq Øe'k%2] 4] 8 fYk["xA

1/8½ e/; Òkx"aeaØe'k%2 , oa4 dk nqkuk t"m+dj I fØ; k i wLZdjxA

bl h Ádkj

33 ³ ¾	3 ³	27	27	27
		54	54	
27	81	81	27	
¾	35937			

mnkgj .k&2 fuEufYk[kr I ð; kv"adk ?ku Kkr djA

	¼d½ 41	¼[k½ 63	¼x½ 89	¼k½ 91		
gy % ¼d½	41 ³	64	6	4	1	
			2	8		
	68	9	2	1		
	?kuQy ¾	68921				
¼[k½	63 ³	¾	216	108	54	27
			216	108		

		$\frac{3}{4}$	216	$\frac{4}{32}$	$\frac{2}{16}$	$\frac{7}{2}$	
		$\frac{3}{4}$	250@0@4@7	$\frac{3}{4}$	250047		
$\frac{1}{2} \times \frac{1}{2}$	89 ³	$\frac{3}{4}$	512	576	648	729	
				1152	1296		
		$\frac{3}{4}$	512	$\frac{8}{172}$	$\frac{4}{194}$	$\frac{9}{72}$	
		$\frac{3}{4}$	704@9@6@9	$\frac{3}{4}$	704969		
$\frac{1}{2} \times \frac{1}{2}$	91 ³	$\frac{3}{4}$	729	81	9	1	
			162	18			
		$\frac{3}{4}$	729@	$\frac{3}{24}$	$\frac{7}{2}$	@ 1	
		$\frac{3}{4}$	753	5	7	1 $\frac{3}{4}$	753571

vH; kl

fuEufYkf[kr l ð; kv"adk eku vku#l; sk fof/k l sKkr dhft,

1- 28³ 2- 53³ 3-71³ 4- 88³

mùkj eYkk

1- 21952 2- 148877 3-357911 4- 681472

2- ß; konua rkonuhdR; ox± p ; kt ; rP

vk/kkj dsfudV dh l ð; kvka dk ?ku bl fof/k l sKkr fd; k tkrk gA bl fof/k l s l ð; k dk ?ku Kkr djusdsfyk, l oÁFke vk/kkj l ð; k , oafopYku Kkr fd; k tkrk gA ?ku earhu ðkx g"rsgA

ck; k; ðkx @ e/; ðkx @nk; k; ðkx

vk/kkj l ð; k + $\frac{1}{3}$ × fopYku $\frac{1}{2}$ @3 × fopYku² @ $\frac{1}{2}$ fopYku $\frac{1}{2}$

; Fkk LFkku ij mä ÁfØ; k l s l ð; kv"ad" fyk[kus l s ?ku Ákr g" tkrk gA fuEufYkf[kr mnkgj.k l s ÁfØ; k l e>h tk l drh gA

mnkgj.k&1- 104 dk ?ku Kkr dhft, A
 gy& 104³ $\frac{3}{4}$ $\frac{1}{4}$ 00\$3 × 04 $\frac{1}{2}$ @3 × $\frac{1}{4}$ 04 $\frac{1}{2}$ @ $\frac{1}{4}$ 04 $\frac{1}{2}$
 $\frac{3}{4}$ 112@48@64
 $\frac{3}{4}$ 1124864

fØ; kfof/k %

$\frac{1}{d}\frac{1}{2}$; gk; ij vk/kkj I ð; k $\frac{3}{4}$ 100] fopYku $\frac{3}{4}$ 104&100 $\frac{3}{4}$ gA
 $\frac{1}{k}\frac{1}{2}$?ku ea rhu Hkkx gkrs gA
 ck; ka Hkkx@e/; Hkkx@nk; ka Hkkx
 ck; ka Hkkx $\frac{3}{4}$ vk/kkj I ð; k \$ 3 × fopyu
 $\frac{3}{4}$ 100 \$ 3 × 04 $\frac{3}{4}$ 112
 e/; Hkkx $\frac{3}{4}$ 3 $\frac{1}{fopyu}\frac{1}{2}$ $\frac{3}{4}$ 3 $\frac{1}{04}\frac{1}{2}$ $\frac{3}{4}$ 48
 nk; ka Hkkx $\frac{3}{4}$ $\frac{1}{fopyu}\frac{1}{2}$ $\frac{3}{4}$ $\frac{1}{04}\frac{1}{2}$ $\frac{3}{4}$ 64
 $\frac{1}{x}\frac{1}{2}$; Fkk LFkku fy[kus ij vHkh"V ?ku $\frac{3}{4}$ 112]4864

/; ku n& $\frac{1}{4}\frac{1}{2}$ nk; a Hkkx , oae/; Hkkx ea vk/kkj I ð; k ea 'kk; ka dh I ð; k ds rY; val fy[ks tkrsgA

$\frac{1}{2}\frac{1}{2}$ nk; a Hkkx ea, oae/; Hkkx ea valka dh I ð; k de gkus ij ck; ha vkj 'kk;
 c<k yrs gA
 $\frac{1}{8}\frac{1}{2}$ nk; a Hkkx , oae/; Hkkx ea valka dh I ð; k vf/kd gkus ij vfrfjDr val
 ck; ha vkj tkM+s tkrsgA

mnkgj .k&2- fuEufYkf[kr I ð; kv"ads?ku Kkr djA

$\frac{1}{d}\frac{1}{2}$ 102 $\frac{1}{k}\frac{1}{2}$ 109 $\frac{1}{x}\frac{1}{2}$ 1005 $\frac{1}{2k}\frac{1}{2}$ 1013

gy& ; gk; ij I ð; k, i vk/kkj I svf/kd g"us ds dkj .k fopYku /kukRed gA

$\frac{1}{d}\frac{1}{2}$ 102 ³	$\frac{3}{4}$ 106@12@08	$\frac{3}{4}$ 1061208
$\frac{1}{k}\frac{1}{2}$ 109 ³	$\frac{3}{4}$ 127@ ₂ 43@ ₇ 29	$\frac{3}{4}$ 1295029
$\frac{1}{x}\frac{1}{2}$ 1005 ³	$\frac{3}{4}$ 1015@075@125	$\frac{3}{4}$ 1015075125
$\frac{1}{2k}\frac{1}{2}$ 1013 ³	$\frac{3}{4}$ 1039@507@ ₂ 197	$\frac{3}{4}$ 1039509197

mnkgj .k&3- fuEufYkf[kr I ð; kv"ads?ku Kkr djA

$\frac{1}{d}\frac{1}{2}$ 97 $\frac{1}{k}\frac{1}{2}$ 998 $\frac{1}{x}\frac{1}{2}$ 991 $\frac{1}{2k}\frac{1}{2}$ 9987

gy& $\frac{1}{d}\frac{1}{2}$; gk; ij I ð; k, i vk/kkj I s de gkus ds dkj .k fopyu __.kkRed gA

vk/kkj 100] fopyu $\frac{3}{4}$ 97 & 100 $\frac{3}{4}$ $\frac{1}{8}$ &3 $\frac{1}{2}$
 ck; ka Hkkx $\frac{3}{4}$ vk/kkj \$ 3 × fopyu
 $\frac{3}{4}$ 100 \$ 3 $\frac{1}{8}$ &3 $\frac{1}{2}$
 $\frac{3}{4}$ 100 & 9
 $\frac{3}{4}$ 91
 e/; Hkkx $\frac{3}{4}$ 3 × $\frac{1}{fopyu}\frac{1}{2}$
 $\frac{3}{4}$ 3 × $\frac{1}{8}$ &3 $\frac{1}{2}$
 $\frac{3}{4}$ 27

nk; ka Hkkx ¾ ¼fopyu½
 ¾ ¼&3½
 ¾ & 27
 ¾ & &

vr%97³ ¾ 91@27@& &

¾ 912700 & 27 ¾ 912673

bl h Ádkj fuEufYkf[kr l ð; kvädk ?ku Kkr dj&

¼d½ 998³ ¾ 994@012@00& ¾ 994011992

¼[k½ 991³ ¾ 973@243@& & & ¾ 973242271

¼x½ 9987³ ¾ 9961@0507@& & & & ¾ 996105067803

vH; kl

fuEufYkf[kr l ð; kvädk eku ^; konwarkonuhdR; oxã p ; kt ; r~ fof/k l sKkr dhft , &

1- 104³ 2- 107³ 3- 99³ 4- 999³ 4- 1008³

mÜkjekYkk

1- 1124864 2- 1225043 3- 970299 4- 997002999 5- 1024192512

3- vkuq l; sk \$; konua rkonuhdR; oxã p ; kt ; r~ fof/k

mik/kkj l ð; k dsfudV dh l ð; kvädk ?ku bl fof/k l sKkr fd; k tkrk g&

l oÁFke vk/kkj] mik/kkj rFkk mik/kkj %vk/kkj dk vuqkr Kkr djrs g&

?ku earhu ðkx g`rs g& ÁfØ; k fuEuor-dh tkrh gS

ck; k; ðkx e/; ðkx nk; k; ðkx

vuqkr² × ¼mik/kkj \$ vuqkr × 3 ¼fopYku½ fopYku³

3 × fopYku½

l ð; kväd" ; FkklFkku fYk[kdj ?ku Kkr dj fYk; k tkrk g&

mnkgj.k&1- 204³ dh x.kuk dj&

gy& 204³ ¾ 2² ¼200\$3×04½@2¼×¼04½½@¼04½

¾ 4×¼212¼@2×48@64

¾ 8489664

fØ; kfof/k %¼d½ ; gk; ij vk/kkj 100 v^g mik/kkj 200 Y`usij mik/kkj l sfopyu ¾

04 g&

¼[k½ mik/kkj l svk/kkj dk vuqkr ¾ 200 ÷ 100 ¾ 2] vk/kkj ea'kl; ka dh

l ð; k ¾ 2

$\frac{1}{2} \times \frac{1}{2}$?ku earhu [k.M gkrsgA nk; havlj rFkk chp ds [k.M eank&nksvud glkA
 $\frac{1}{2} \times \frac{1}{2}$ ck; kaHkkx $\frac{3}{4}$ $\frac{1}{4}$ vujkr $\frac{1}{2}$ $\frac{1}{4}$ mi k/kj \$3 fopyu $\frac{1}{8} \times 4^2$ $\frac{1}{2} \times 200$ \$12 $\frac{1}{8} \times 848$
 $\frac{1}{2} \times \frac{1}{2}$ e/; Hkkx $\frac{3}{4}$ vujkr $\times 3$ $\frac{1}{4}$ fopyu $\frac{1}{2}$ $\frac{3}{4}$ $2 \times 3 \times 4^{23}$ $\frac{1}{6} \times 16$ $\frac{3}{4}$ 96
 $\frac{1}{2} \times \frac{1}{2}$ nk; kaHkkx $\frac{3}{4}$ $\frac{1}{4}$ fopyu $\frac{1}{2}$ $\frac{3}{4}$ $104 \frac{1}{2}$ $\frac{3}{4}$ 64
 $\frac{1}{4} \times \frac{1}{2}$; Fkk LFkku fy [kus ij vHkh"V ?ku i klr gkrk gA
vr%204³ $\frac{3}{4}$ 8489664

mnkgj.k&2- fuEufYkf [kr l d; kv'a dk ?ku Kkr dj&

$\frac{1}{2} \times \frac{1}{2}$ 199 $\frac{1}{4} \times \frac{1}{2}$ 209 $\frac{1}{2} \times \frac{1}{2}$ 307 $\frac{1}{4} \times \frac{1}{2}$ 298

gy& $\frac{1}{2} \times \frac{1}{2}$ 199² $\frac{3}{4}$ 2² {200\$3 $\times \frac{1}{2} \times 1 \frac{1}{2}$ @2 $\times 3 \times 10 \frac{1}{2}$ @10 $\frac{1}{2}$
 $\frac{3}{4}$ 4 $\frac{1}{2} \times 97 \frac{1}{2}$ @06 @0 $\frac{1}{2}$
 $\frac{3}{4}$ 7880599
 $\frac{1}{4} \times \frac{1}{2}$ 209³ $\frac{3}{4}$ 2² $\frac{1}{2} \times 200$ \$3 $\times 9 \frac{1}{2}$ @2 $\frac{1}{8} \times 09^2 \frac{1}{2}$ @10 $\frac{1}{2}$
 $\frac{3}{4}$ 4 $\frac{1}{2} \times 27 \frac{1}{2}$ @₄ 86 @₇ 29
 $\frac{3}{4}$ 908 @₄ 86 @₇ 29
 $\frac{3}{4}$ 9129329
 $\frac{1}{2} \times \frac{1}{2}$ 307³ $\frac{3}{4}$ 9 $\frac{1}{8} \times 21 \frac{1}{2}$ @3 $\times 3 \times 49$ @343
 $\frac{3}{4}$ 2889 @₄ 41 @₃ 43
 $\frac{3}{4}$ 28934443
 $\frac{1}{4} \times \frac{1}{2}$ 298³ $\frac{3}{4}$ $\frac{1}{6} \times 02 \frac{1}{2}$ $\times 9 \frac{1}{8} \times 80 \frac{1}{2}$ @3 $\times 3 \times \frac{1}{4}$ 2 $\frac{1}{2}$ @ $\frac{1}{4}$ 2 $\frac{1}{2}$
 $\frac{3}{4}$ 275 $\frac{1}{4}$ @36 @08
 $\frac{3}{4}$ 26463592

vH; kl

fuEufYkf [kr dk eku Kkr dhft , &

- 1- 198³
- 2- 204³
- 3- 304³
- 4- 398³

mUkjekYkk

- 1- 7762392
- 2- 8489664
- 3- 28094464
- 4- 63044792



v/; k; &6

?kuewy

iwkZ ?ku I ; k dk ?kueWk Kkr djuk&

foykdue~ fof/k&

N%vdkard dh iwkZ?ku I ; k; kvka dk ?kuewy foykdue~i) fr I s Kkr fd; k tk I drk gA fuEukidr I kj.kh dksn[ka

I ; k	1	2	3	4	5	6	7	8	9	10
?ku	1	8	27	64	125	216	343	512	729	1000
chtka	1	8	9	1	8	9	1	8	9	1

mi; Dr I kj.kh I s Kkr g'rk gSfd&

¼½ ?kul I ; k ds chtka 1] 8] 9 gh gks I drs gA vr%chtka bu rhuka ds vfrfjDr v[dkbZ gks rksog I ; k iwkZ?ku ughagks I drhA

½¾ ftu I ; k; kvkad h nkb[v['k; kadh I ; k rhu ; k rhu ds vi or; Z½xqkt½ ughagks h os I ; k; i v iwkZ?ku I ; k; k gks rks gA t\$ s100] 80000] 1250000 vkfn viwkZ?kul I ; k gA

iwkZ ?kul I ; k ds ?kuewy dk pjeka bdkbZ Kkr djuk&

¼½ I ; k dk pjeka 2 gks rks ?kuewy dk pjeka 8 gksk tks 2 dk ijefe= 10 dk ijd gS v[bdkbZ I ; k dk pjeka 8 gks rks ?kuewy dk pjeka 2 gskA

½¾ I ; k dk pjeka 3 gks rks ?kuewy dk 7 v[I ; k dk pjeka 7 gks rks ?kuewy dk 3 gskA

¾ I ; k dk pjeka buds vfrfjDr dN Hkh gks t\$ s1]4]5]6]9]0 gks rks ?kuewy dk pjeka Hkh ogh gskA

vr%foykdue~i) fr I sfd I h Hkh iwkZ?kul I ; k dk pjeka bdkbZ dk v[½ fy[kk tk I drk gA

N%vdkard dh iwkZ ?kul I ; k dk ngkbZ vd Kkr djuk

I ; k ds rhu&rhu vdkads [k.M nkfguh v[I sdjA n[jk [k.M rhu vdkal sde Hkh gks I drk gA t\$ s17576 dk igyk [k.M 576 v[n[jk 17 gskA iwkZ?kul I ; k ds n[js [k.M dksn[kdj gh ?kuewy dk ngkbZ dk vd crk; k tk I drk gA

I ĩ; k dk nřjk [k.M	?kuey dk ngkbZ vřd	I ĩ; k dk nřjk [k.M	?kuey dk ngkbZ vřd
1 s 7	1	216 s 342	6
8 s 26	2	343 s 511	7
27 s 63	3	512 s 728	8
64 s 124	4	729 s 999	9
125 s 215	5		

mnkgj.k&1- iwł?ku I ĩ; k 17576 ds?kuey eabdkbZ dk vřd 6 gksck D; křd I ĩ; k dk pjekřd 6 gSvkř nřjk [k.M 17 gř vr%ngkbZ ds LFkku ij 2 gksckA vr%iwl?ku I ĩ; k 17576 ?kuey 3/4 26 gksckA

mnkgj.k&2- iwł?ku I ĩ; k 29791 dk ?kuey Kkr djřA gYk %pjekřd 1 gř vr%?kuey dk pjekřd Hkh 1 gksckA nřjk [k.M 29 gř I kj.kh I sngkbZ vřd 3 gksckA ; gk; 29 dk fudVre ?kueYk 3 gř vr%ngkbZ 3 gř vr%29791 dk ?kuey 3/4 31

9 vřrd dh iwł?ku I ĩ; k dk ?kueYk Kkr djřk&

mnkgj.k&1- iwł?ku I ĩ; k 258474853 dk ?kuey Kkr dhft, A

		63	
		258	474 853
gy %	&6 ³	&216	
	3×6 ² 3/4 108	424	
	Hkkx	&324	

fØ; kfof/k %

- 1/1½ přd nh x; h I ĩ; k ea ukS vřd gř vr%?kuey ea 3 vřd gksckA
- 1/2½ 258 dk eku 6³ vkř 7³ dse/; vr%?kuey dk I dMř dk vřd 6 gksckA
- 1/3½ I eñ 853 eabdkbZ 3 gks ds dkj.k ?kuey dk pje vřd 7 gksckA
- 1/4½ bl izdkj nh gř I ĩ; k dk ?kuey 3/4 6 x 7] tgk; x dk eku Kkr djřk gřA
- 1/5½ x dk eku Kkr djř ds fy; sck; a I eñ 258 ea I s 6³ vřkř -216 ?kVkus ij 'křk 42 cprk gřA
- 1/6½ nřj s I eñ 474 dk i Fke vřd 4 mřkjus ij u; h I ĩ; k 424 i kř gřA
- 1/7½ 424 ea 3×1/6^{1/2} 3/4 108 I shkx nsus ij Hkkx Qy 3 i kř gksck gř vr%e/; dk vřd x 3/4 3- vr%?kuey 3/4 637

mnkgj.k&2- i wkZku I d; k 77308776 dk ?kueny Kkr dhft, A

		42		
		77	308	776
gy %	&4 ³	864		
	3×4 ² ¾ 48	133		
	Hkkx	& 96		

fØ; k fof/k %

pfid nh x; h i wkZku I d; k ea8 vad gSvr%
 ¼½ ?kueny earhu vad g`x&
 ½½ ?kueny dk pje vad ¾ 6 g`xk D; fid i wkZku I d; k dk pje vad 6 g&
 ?kueny dsI dMsdk vad ¾ 4 g`xk D; fid ck; k; [k.M 77 g& 77 dk fudVre
 ?kueWk 4 g&
 ?kueny dse/; dk vad ¾ 2
 vr%77308776 dk ?kueny ¾ 426

vH; kl

v/kkfyf[kr i wkZku I d; kvkadk ?kueny foykdue-fof/k I sKkr dj&
 ¼d½ 32768 ¼k½ 42875 ½x½ 3375 ¼k½ 97336
 ¼p½ 357911 ¼p½ 85184 ¼N½ 912673 ¼t½ 592704
 ¼>½ 753571 ¼^½ 175616

mÜkjekYkk

¼d½ 32 ¼k½ 35 ½x½ 15 ¼k½ 46 ¼p½ 71
 ¼p½ 44 ¼N½ 97 ¼t½ 84 ¼>½ 91 ¼^½ 56

?kueWk % Hkkx vk/kkfjr fof/k

6 vadkard dh I Hkh i wkZku I d; kvkadk ?kueny foykdue-fof/k I sikr gkrk g&
 I Hkh i wkZku rFkk vi wkZku I d; kvkadk ?kueny Hkkx vk/kkfjr fof/k; ka I sikr
 fd; k tk I drk g& Hkkx vk/kkfjr nksfof/k; k; g& nksuka gh fof/k; k; i kphu g& ft I ea, d
 fof/k I s?kueny Kkr djuk fn; k tk jgk g& bl i) fr ea(a+b+c+....)³ dks Å/otr; Z-
 i) fr I sxqkk djusI sikr folrkj dk mi; kx gkrk g& mÜkj eaftrusvad pkfg, mruh
 gh I d; k ea pj a, b, c vkfn yuK gksk&A folrkj bl idkj dk gksk&

$$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$$

$$(a + b + c)^3 = a^3 + 3a^2b + (3a^2c + 3ab^2) + (6abc + b^3) + (3ac^2 + 3b^2c) + 3bc^2 + c^3$$

$$(a+b+c+d)^3 = a^3 + 3a^2b + (3a^2c+3ab^2) + (3a^2d + 6abc + b^3) + 3ac^2 + (6abd + 3b^2c) + (6acd + 3bc^2 + 3b^2d) + (3ad^2 + 6acd + c^3) + (3bd^2 + 3c^2d) + 3cd^2 + d^3$$

fØ; kfof/k%

- 1- ftl l ð; k dk ?kueny fudkyuk gksml dh bdkbZdh vkj l srhu&rhu vðkæds l eug cuk, A vflre l eug rhu l sde vðkædk gksl drk gA l ð; k n'keyo ea gksrksl eug cukusdk dke n'keyo fclnql sdjA , d&, d l eug dsl ær ?kueny dk , d&, d vð gkskA
- 2- ck, j l siEke l eug dk fudvRe ?kueny okyk vð mÛkj dk ck, j l siEke vð gkskA ekuk fd og vð a gSvkj $a^3 \leq$ iEke l eug gA
- 3- Hkktd dsLFkku ij $3a^2$ dksLFkfir djA
- 4- iEke l eug ea a^3 ?kVk, avkij 'kSk dksnh gþZl ð; k dsvxysvð dsck, j FkkMk uhps fy[kdj nÛ jk HkkT; i klr djA
- 5- nÛ jsHkkT; eaHkktd $3a^2$ l sHkkx nA HkkxQy mÛkj dk nÛ jk vð b gkskA 'kSk dksnh gþZl ð; k dsvxysvð l sck, j FkkMk l k uhpsfy[kdj rhl jk HkkT; i klr djA ; gk rd dh fØ; k ea?kueny dsnksvð i klr gksrgA
- 6- rhl jsHkkT; l siEkeHk dj vkxsdsHkkT; kædk l ákkæ/kr HkkT; $\frac{1}{4}$ HkkT; $\frac{1}{2}$ eaHkkx $3a^2$ l sHkkx nrsqg vkxsdh fØ; k gksuh gA rhl jsHkkT; ea l s $3ab^2$?kVk dj l HkkT; cuk, j ftl eaHkktd $3a^2$ l sHkkx nA HkkxQy vð c ?kueny dk rhl jk vð gksk rFkk 'kSk dksnh gþZl ð; k dsvxys vð dsck, j uhpsj[kdj pkFkk HkkT; i klr djA ; gk rd dh fØ; k ea?kueny ds rhu vð i klr gksrgA
- 7- pkFksHkkT; ea $b^3 + 6abc$?kVk dj l HkkT; Kkr djæftl ea $3a^2$ l sHkkx nrsvkfn dh fØ; k djuh gA
- 8- i kpoaHkkT; ea l s $3ac^2 + 3b^2c$?kVkdj l ákkæ/kr djavkij Åij dsl eku fØ; k djA
- 9- NBsHkkT; ea l s $3bc^2$?kVk, j Åij dsl eku fØ; k djA
- 10- l kroaHkkT; ea l s c^3 ?kVk, j rFkk mijkDr idkj l svkxsc<A mÛkj ea3 ; k 4 vðkærd x.kuk djuh gksrksmDr fØ; k i ; klr gA vxj HkkxQy 'kû; vkrk tk, rksvkxsdsin Hkh 'kû mÛkj næsvl; Fkk l ákkæku dh i fØ; k eackn okys inkæaifjorZu djuk gkskA

mnlgj.k&1 %42875 dk ?kueny Kkr djA

gy& bdkbzdh vlsj l sl emj cuk, A nksl emj cursgñ nñ jk l emj 42 dk gsft l l s?kueny dk i fke vad fuf'pr gksuk gA dk; ã Vy bl izdkj l sgkskA

$$\begin{array}{r|rrrr} 27 & 42 & 8 & 7 & 5 \\ \hline & 3 & 5 & 0 & 0 \end{array}$$

fØ; kfof/k&

- 1- ck, a i fke l emj 42 dk fudVre ?kueny 3 gA ; g gekjs mÙkj dk i fke vad $a = 3$ gA bl s; Fkk LFkku 42 ds 2 dh l h/k eafy ["aA
- 2- Hkktd $3a^2 = 3 \times 3^2 = 27$ gA bl s; FkkLFkku fy [kA
- 3- $42 - a^3 = 42 - 27 = 15$ dks vxys vad ds igys FkkMlk uhps fy ["aks rks f} rh; HkkT; $\frac{3}{4}$ 158 gq/kA
- 4- $158 \div 3a^2 = 158 \div 27$ l sHkkxQy 5 vj 'kSk 23 gq/kA ; g ?kueny dk nñ jk vad gsft l s8 dh l h/k eafy [kA nksl emj gñ vr% mÙkj ea2 vad gkA vr% nks vad ka dsckn vFkkZ-35 dsckn n'keyo fclnqyxk; aA
- 5- 'kSk 23 dks vxys vad 7 ds ck, j fy [kus ij r rh; HkkT; 237 gq/kA ; gk l s l ákkáku dh fØ; k i jEHk gkrh gA l HkkT; $\frac{3}{4}$ $237 - 3ab^2 = 237 - 3 \times 3 \times 5^2 = 12$
- 6- $12 \div 27$ $\frac{3}{4}$ HkkxQy vad 0 tks ?kueny dk rhl jk vad $c(=0)$ gA bl s 7 dh l h/k eafy [kA 'kSk 12 dks vxys vad 5 ds ck, j fy ["aA
- 7- HkkT; $\frac{3}{4}$ 125 l HkkT; $\frac{3}{4}$ $125 - (b^3 + 6abc) = 125 - (125 + 0) = 0$
- 8- l HkkT; \div Hkktd $\frac{3}{4}$ $0 \div 27 = 0$ ft l s5 dh l h/k eafy ["aks rFkk 'kSk $\frac{3}{4}$ 0 i fØ; k ; gk l ektr gkrh gA vÙr ea8oa in eaHkkxQy $\frac{3}{4}$ 0 vlsj 'kSk $\frac{3}{4}$ 0 l sKkr g'rk gsfd nh gbl l ã; k i wkZku gsrFkk bl dk ?kueny 35 gA

; g fØ; k vlsj Nk/h gks l drh gA nksl emj gksus ds dkj .k mÙkj nks vad ka dk gkskA bl dsckn n'keyo ds vad vk l drsgA Åij dh fØ; k eaØekad4 rd eanksvad i ktr gq vlsj ?kueny ds i fke nks vad 35 gqA fØ; k ; ghajkdj /; ku l snf [kA 42875 ds vÙr ea5 gs tks mÙkj ds bdkbz vad ea5 gksus dh vlsj bñxr dj jgk gA vr% 35^3 dj ds nq [kus ij 42875 vk tkrk gA nh gbl l ã; k i wkZku gA mÙkj 35 gA vks ds in Nk/s tk l drsgA

mnlgj.k&2 % 258474853 dk ?kueVk Kkr djA

gy& rhu&rhu vad k ds rhu l emj 258] 474] 853 cursgA mÙkj earhu vad gkA vlsj ml dsckn n'keyo fclnqyxskA ck, ; okys l emj 258 dk fudVre ?kueny 6 gñ tks mÙkj dk i fke vad $a = 6$ vlsj i fØ; k dk Hkktd $3a^2 = 108$ dk fu/kkZ .k dj nrk gA dk; ã Vy bl izdkj dk gkskA

108	258	4	7	4	8	5	3
	₄₂	₁₀₀	₈₉	₁₁₁	₄₇	₃₄	
	6	3	7	0	0	0	0

vr%258474853 dk ?kuey ¾ 637] 'kSkQy ¾ 0

fØ; kfof/k &

- 1- 258 & 6³ ¾ 258&216 ¾ 42
- 2- f}rh; HkkT; ¾ 424
- 3- Öktd ¾3a² = 3 × 36 = 108
- 4- 424÷108 ¾ 3] 'kSk ¾ 100
- 5- r}rh; HkkT; ¾ 1007
I HkkT; ¾ 1007 & 3ab² ¾ 1007 & 3×6×3² ¾ 845
- 6- 845÷108 ¾ 7] 'kSk ¾ 89
- 7- prf}kz HkkT; ¾ 894
I HkkT; ¾ 894 & b³ & 6abc ¾ 894&3³ & 6×6×3×7 ¾ 111
- 8- 111÷108 ¾ 0] 'kSk ¾ 111
; g p}k}k vd gSvr%?kuey dsLFkku ij n'keyo fclnqyxkdj rc bl sfy[kk
- 9- ipe HkkT; ¾ 1118
I HkkT; ¾ 1118 & ½ac²+3b²c½ ¾ 1118&½×6×7²\$3×3²×7½ ¾ 47
47÷108 ¾ 0] 'kSk ¾ 47] bluga; Fkk LFkku fy[kk
- 10- NBk HkkT; ¾ 475
I HkkT; 475&3bc² ¾ 475&3×3×7² ¾ 475 & 441 ¾ 34
- 11- 34÷108 ¾ 0] 'kSk ¾ 34] bluga; Fkk LFkku fy[kk
- 12- I kroka HkkT; ¾ 343
I HkkT; ¾ 343&c³ ¾ 343&7³ ¾ 0] 'kSk ¾ 0
HkkxQy ea3 dh I h/k ea0 fy[kdj fØ; k iw}zdj}k} HkkxQy ¾ 0 vk} 'kSk¾0
gk}sl sLi"V gSfd nh g}zI }k; k iw}zku g} vr%nh x; h I }k; k dk ?kue}k ¾ 637
in 5 ij ?kuey dsm}kj dsLFkku ij 637 i}kr gksp}sg} 7³¾343 dh b}k}z
ea3 gSvk} nh g}zI }k; k dh b}k}z}eaHkh 3 g} vr%nh g}zI }k; k iw}zku gk}vk} 637³
dscj}kj gk}bl dh I Hkkkouk g} vLr}; gk} 637³ dj} djusij nh g}zI }k; k i}kr gk}rh
g} vLr}; gk} ?kuey fudkyus dh fØ; k dksfojke fn; k tk I drk g}
, d k u d}rs}gq vk}sr}d fØ; k djuk gk}rksvk}sr}dh fØ; k dj}k}

fo'kSk% I ákkf/kr HkkT; eaHkkx nrs l e; ; g vuþku yxkuk gSfd vkxs ds I ákkfku ea I HkkT; __.kkRed rksughags tk, xkA , d k gks ds h I Hkkouk yxus ij HkkxQy Fkkb/lk Nks/k yrs gð rFkk 'kSk ; fn Hkktd $3a^2$ I scMk gks rks gksus nrs gð
mnkgj.k&3 %10 dk ?kueny Kkr djA
gy&

$$\begin{array}{r|l} 12 & 10 - 2^0 \quad 8^0 \quad 14^0 \quad 31^0 \\ \hline & 2 - 1 \quad 5 \quad 4 \dots \quad m\ddot{u}kj \end{array}$$

fØ; kfof/k &

- 1- 10 eavf/kdre $2^3 \frac{3}{4} 8$?kV I drk gð mÜkj dk i Fke vad $a = 2$ gq/k rFkk 'kSk 2 gq/kA nksuka dk ; FkkLFkku j [kkA Hkktd $\frac{3}{4} 3a^2 \frac{3}{4} 12$ gksckA
- 2- nll jk HkkT; 20 gð $20 \div 12 \frac{3}{4} 1$ 'kSk 8
- 3- rhl jk HkkT; 80 gð I HkkT; $\frac{3}{4} 80 \& 3ab^2 \frac{3}{4} 80 \& 6 \frac{3}{4} 74$
- 4- $74 \div 12 \frac{3}{4} 5$ 'kSk 14 fy; kA ; fn HkkxQy 6 yrs rks vkxs dk I HkkT; __.kkRed vkrkA
- 5- pkfkk HkkT; $\frac{3}{4} 140$ I HkkT; $\frac{3}{4} 140 \& \frac{1}{2}b^3 + 6abc \frac{3}{4} 140 \& 61 \frac{3}{4} 79$
- 6- $79 \div 12 \frac{3}{4} 3$ 'kSk 31
 bl i fØ; k I s?kueny eaplj vad kard mÜkj dh 'kq' rk dh I Hkkouk gð pkfks vad ea 6 ckj ; k 5 ckj yxus ij vkxs ds HkkT; ka ds I ákkfku ij I HkkT; __.k vkrk gð ; g nqk fy; k x; k gð vr%4 gh fy; k x; kA vLrq 10 dk ?kueny $\frac{3}{4} 2-154 \dots$

mnkgj.k&4% 2 dk ?kueny Kkr djA

gy& Li"V gSfd , d gh I eq cuska dk; i Vy , d k gksckA

$$\begin{array}{r|l} 3 & 2 - 1^0 \quad 4^0 \\ \hline & 1 - 2 \end{array}$$

Hkktd cgr Nks/k gð rhl jk HkkT; 40 gSft I s'kq' djus ij $40 \& 3ab^2 \frac{3}{4} 40 \& 12 \frac{3}{4} 28$ gq/kA Hkktd 3 I s Hkkx nrs ij HkkxQy 9 gks I drk gð ijUrq 9]8]7 rhuka gh , d sgðfd vkxs I ákkf/kr HkkT; __.kkRed gks tkrk gð ckj&ckj ml dfBukbZ dk I keuk djuk i Mxka

mä dfBukbZd" I jYk cukusdsfYk, 2 dks i l un dh I ð; k ds?ku I sxqkk djrs gñrkfd i Fke I eñ cMk gks tk; A 2 d" 7³ ¼ 343 I sxqkk djus ij i Fke I eñ 686 curk gS ijUrq8³ ¼ 512 I sxqkk djus ij 1024 ykuk vñ; igyk I eñ 3 dsLFkku ij 4 vñka dk ysuk vf/kd I fof/kktud gñ ikr ?kueñ dks 8 I sHkkx nus ij 2 dk ?kueñ feyskA fØ; kfof/k fuEuor-g"xA

300	1024 - ⁰ ₂₄	⁰ ₂₄₀	⁰ ₃₀₀	⁰ ₃₀₀
	I HkkT;	2400	3000	1530
8	10 - 0	7	9	3 ; k 4
	1 - 2	5	9	9

fØ; kfof/k & foykdue- I s1024 eafudVre ?ku I ð; k 10³ ¼ 1000 gñ vr-%?kueñ ea a = 10 fy; k vñ; Hkktd 3a² = 300 fy; kA f}rh; HkkT; 240 ÷ 300 ¼ 0] 'kSk ¼ 240] rrh; HkkT; ¼ 2400

I HkkT; ¼ 2400 & 3ab² ¼ 2400 & 3 × 10 × 0² ¼ 2400 & 0 ¼ 2400

2400 ÷ 300 ¼ 7] 'kSk ¼ 300

prfKz HkkT; ¼ 3000] I HkkT; ¼ 3000 & b³ & 6abc ¼ 3000 & 0 ¼ 3000

3000 ÷ 300 ¼ 9] 'kSk 300] vxyk HkkT; ¼ 3000

I HkkT; ¼ 3000 & 3ac² - 3b²c - 6abc ¼ 3000 & 1470 & 0 & 0 ¼ 1530

1530 ÷ 300 I sHkkxQy ¼ 3 ; k 4] 8 I sØkx nus ij 10-0793 ÷ 8 ¼ 1-2599

vr% $\sqrt[3]{2}$ ¼ 1-2599 **mUkj**

mngj.k 5 %25 dk ?kueñ rhu n'keyo vñka rd Kkr djA

gy & , d gh I eñ cusxk ¼ 25] ml dk 3³ ¼ 27 I sxqkk djus ij A

25 × 27 ¼ 675 vñ; fØ; kfof/k fuEuor-g"xA

Ákr ?kueñk eamI s3 I sØkx nus ij 25 dk ?kueñk Ákr g" tk; skA

192	675 - ⁰ ₁₆₃	⁰ ₂₈₆	⁰ ₃₄₀	⁰ ₃₂₁
	I HkkT;	1684	705	
3	8 - 7	7	2	0 ; k 1

3 l sÒkx nus ij 8-7720 ÷ 3 ¾ 2-9240

vr%25 dk ?kueW ¾ 2-9240

fØ; Kfof/k & 675 dk fudVre ?ku 8³ ¾ 512 gA ?kueW ds LFkku $a = 8$ rFkk Hkktd ds LFkku ij $3a^2 = 192$ dks LFkfir fd; kA

675 & 512 ¾ 163

f}rh; HkkT; ¾ 1630

1630 ÷ 192 ¾ 7] 'kSk 286

r}rh; HkkT; ¾ 2860

I HkkT; ¾ 2860 & $3ab^2$ ¾ 2860 & 1176 ¾ 1684

1684 ÷ 192 ¾ 7] 'kSk 340

prf{kz HkkT; ¾ 3400

I HkkT; ¾ $3400 & b^3$ & $6abc$ ¾ $3400 & 343 & 2352$ ¾ 705

705 ÷ 192 ¾ 2] 'kSk 321

bl Ádkj Áklr mùkj eá3 l sÒkx nus ij 25 dk ?kueW Áklr g" tkrk gA

vr% $\sqrt[3]{25}$ ¾ 8-7720 ÷ 3 ¾ 2-9240

vH; kl

Òkx vk/kkfjr fof/k l s ?kueW Kkr dhft, &

1- 148877

2- 238328

3- 592704

4- 17 dk ?kueW n'kyko dsn" v'd'ard Kkr dhft,

mùkj eYkk

1- 53

2- 62

3- 84

4- 257



Hkkx&3
Hkkjr ds iæqk xf.kr kpk; Z
v/; k; &7
cãxlr

cãxlr dk tle 598 bD vFkkZ-520 'kd l or-1/541 fo0l 0½ ea gq/k FkKA buds fir k dk uke ft".kq FkKA budk tle LFkku fhkÉeky] ekm.V vkcy jktLFkku ea gA ; g xqfjkr l hek l syxk gq/k gA f0É ekYk ; k f0YYkekYk ; k JhekYk uxj vkcwi oZ ds djhc 65 fdeh if'peÜkj ea Ykuh unh ds rV ij cl k mÜkj xqfjkr dh jkt/kkuh FkKA cãxlr ds l e; ; g , d oÐo'kkYkh uxj FkKA ml l e; mÜkj 0kj r ea g"kb/kZ dk 'kk l u FkKA cãxlr mTtS x#dy ds iæqk [kxkys 'kkL=h FkKA mUgkus 30 o"kZ dh vk; q1/628bD½ ea **ßcãLQW fl) klr** uked ifl) xBFk dh jpuk i | ea dha cãLQW fl) klr Hkkj rh; [kxkys 'kkL= dk ikekf.kd , oaekud xBFk gA bl xBFk ea **24 v/; k; rFk 1080 'ykd** gA bl xBFk ea xf.kr , oaT; "fr" k dh fo" k , oa0; ki d tkudkj nh x; h gA

cãxlr us xf.kr d" n" 0kx"aeack/k&

1& i kvh xf.kr

2& d' d xf.kr 1/4t" ckn ea ch txf.kr dsuke l s ÁpfYkr gq/½

bl xBFk ds vfrfjä blg"us 665 bD ea 67 o"kZ dh vk; q ea , d n" js xBFk **B[k.M[kk] deÞ** uked xBFk dh jpuk dhA bl eafo'kSkdj varoZ ku 1/2 interpolation½ rFk l ery f=dkskfevr , oaxksh; f=dkskfevr nkukea sine 1/4T; k½ vkS cosine 1/4dkSVT; k½ ds fu; e mi yC/k gA cãxlr ds bu xBFk ds vjch vkS Qkj l h Hkk"kk ea vuþkn dsek/; e l s Hkkjr dk ; g xf.kr , oa [kxkys foKku dk Kku vjc rFk ckn ea if' pe ds nS kka dks i klr gq/kA **xf.kr ds { "k ea eglo i ulZ ; "xnku&**

1- oxëy rFk ?kuëy Kkr djus dh l jy fof/k; k; nh gA

π dk eku $\sqrt{10}$ crk; k gA

- 2- 'k; ds xqk/keZ dh 0; k[; k dh gA
 $v \& 0 \quad \frac{3}{4} v$
 $\& v \& 0 \frac{3}{4} \& v$
 $0 \& 0 \quad \frac{3}{4} 0$
 $v \times 0 \quad \frac{3}{4} 0$
 $0 \times 0 \quad \frac{3}{4} 0$
 $0 \div 0 \quad \frac{3}{4} 0$
 $v \div 0 \quad \frac{3}{4} \text{ rPNn } \frac{1}{4} \text{ ur} \frac{1}{2}$
- 3- oxl ehdj .k dsey Kkr djusdh fof/k cãxlr usfuEuor-nh g}

oxþrãq. krkuka : i k. ka e/; oxl fgrkukeA

eyya e/; sika oxl} xqk} rã/; AA

vdvdk/; k; } 18-44½

vFkZ&

ekuk fd oxl l ehdj .k $ax^2 + bx = c$ gA

$$\text{rc } x = \frac{(\sqrt{4ac + b^2}) - b}{2a}$$

orëku eapfyr l # rFkk bl fof/k eal ekurk Lo; aLi "V gA

- 4- $Nx^2 + c = y^2$ bl idkj dsf} ?kkrh vfu/kkZ Zl ehdj .kka dks gy djus dsfy,
 cãxlr us nks i d} es ka ¼ emmas½ dk iz kx fd; k gA ckn ea bu i d} es ka dks
vk; yj rFkk ykxãt us Hkh Lora : i l s vkfo" d} fd; kA
- 5- bl gaus f=Hkqt rFkk pØh; prHkqt ds {ks=Qy Kkr djus dk l # fn; k gS%

LFlay Qya f=prØt ckqg i frckq kxny? kkr AA

Hkqt; kxk/kprØv; Hkqt ks? kkr Ri na l ee- AA

vFkZr-Hkqt kvka ds; kx ds vk/ks dks pkj ckj fy [kdj Hkqt k, j ?kV/k, j bl ga xqkk dj
 oxëy fudkyA

- pØh; prHkqt dk {ks=Qy $\frac{3}{4} \sqrt{(s-a)(s-b)(s-c)(s-d)}$

¼t gka a, b, c, d pØh; prHkqt dh Hkqt k, j gA rFkk $2s = a + b + c + d$ gA½

- f=Hkqt dk {ks=Qy $\frac{3}{4} \sqrt{s(s-a)(s-b)(s-c)}$ ¼t gk $2s = a + b + c$ ½

6- **cāxlr** Áeş & pØh; prhkt dh Hkqt k, j Kkr gkus ij ml ds d. kka dh yEckbz k; Kkr djus dk l = ml gkus fn; k gš tks bl izdkj g&

d. k&1 Hkqt ? kkr Ø; eHk; FkU; kU; Hkkt ra xqk; sA
; kxsi Hkqt i fr Hkqt o/k; k% d. k& ins fo'leAA

[{k=0; ogkj} 'ykd 28]

; fn a, b, c , oad pØh; prhkt dh Hkqt k, j gkarks

$$d.k&1 \text{ dk eku} = \sqrt{\frac{ad+bc}{ab+cd}} \times (ac+bd)$$

$$d.k&2 \text{ dk eku} = \sqrt{\frac{ab+cd}{ad+bc}} \times (ac+bd)$$

; g l = **cāxlr** i eş dsuke l sifl) gA

7- **cāxlr** dk i wkd pØh; prhkt & cāxlr us , d s pØh; prhkt ka dh jpuk djus dh fof/k crkbz ft l eal Hkh ij . kke %eki ½ i wkZ l d; k gA mnkgj . k k Fk% Hkqt kvka dh yEckbz %60] 32] 25] 39½ d. kka dh yEckbz %6] 63½ {k=Qy %1764½} c fgoDk dk 0; k l %65½ y? Hkqt k dk i dki %24½ d. kka ds i fr PNn } kjk fufeR vUr% [k. Mka dseki %16] 40] 30] 33½ d. kka ds vUr %Nn %86] 20] 48] 15½; s l Hkh i wkd l d; k gA bl izdkj ds ij . kke nus okys fo'o ds i Fke xf. krK **cāxlr** gA ckn ea xf. krK vk; yj %1707&1783½ usbl izdkj dspØh; prhkt cukus dh fof/k Kkr dhA

cāxlr ds xf. kr ds {k= eaeksyd , oavf} rh; ; kx nku ds vk/kkj ij egku xf. krK **Hkldjpk**; Z us mlga **x.kd pØ pMkef.k** dh mikf/k l s l Eekfur fd; k gA

cāxlr d' vjch xf. krK a dk **vkfn xq** ekuk tkrk gA foKku ds Á[; kr bfrgk l xkj **tktzl wZ** dk dFku g& **cāxlr** Økjr Øfe ds , d egku **oKkud F] vius l e;** ds l oZSB **oKkud** , oaxf. krK **F'A**** fu'p; gh l d kj dsegku xf. krK aeacāxlr dk LFku **eqV ekf. lD**; dh rjg l o'z fj gA



Jh/kjpk; Z

Jh/kjpk; Zdk tle 750bD ¼yxHkx½dukV/d eagq/kA budh ekrik dk uke v0o"dk rFkk fir k dk uke cYkn0 'kekZFkKA cpi u eavi usfir k l sl hÑr ,oadéM+l kfgR; dk v/; ; u fd; k

xf.kr ds{ks= eaJh/kj ds xBFk vR; Ur eW; oku-gA mlgkaus, d svud l # inku fd; s tks bul sigysvKkr FkA buds nks xBFk mi yC/k g&

1- f='kfrdk ¼xf.kr l kj½ 2- i kVhxf.kr

xf.kr l kj budk cgpfpz xFk gA bl ea300 'Yk" d gA 300 'Yk" d g" usdsdkj .k ; g xBFk f«kf' kfrdk dsuke l s0h Áfl) gA bl xBFk eaÁkÑfrd l d; kv"adh ek«kk, j xqkk] Òkx] 'k;] ox] oxZk] ?ku] ?kueWk] f0é] «gkf'kd] C; kt] feJ.k] l k>k] ekfi dh] Nk; k eki u vkfn dk mYY" [k gA

f«k'kfrdk ea blg"us 'k; ds xqk" a dk mYY" [k fd; k g&

- l d; k + 0 ¾ l d; k
- l d; k & 0 ¾ l d; k
- 0 × l d; k ¾ 0
- l d; k × 0 ¾ 0
- 0 dk oxZ ¾ 0
- 0 dk oxZk ¾ 0
- 0 dk ?ku ¾ 0
- 0 dk ?kueWk ¾ 0
- 0 }kj k Òkx dk mYY" [k ugÉ fd; k x; k gA

blg"us vdx f.kr i j uo'kfrdk] f«k'kfrdk vg i kVh xf.kr rFkk chtxf.kr ea i qrd"adh jpuk dhA

Jh/kjpk; Z dk ; kxnu&

1- n'kxqkkkjk l d; k, &

, da n'k 'kreLeKr- l gL=e; qra rr% i ja yl ea

iz qra dKVeFKcpeCta [koā fu[koā p AA2AA

rLeKlegkl jksta 'kōq l fjrkā fra rRLRoUR; ea

e/; a ijk/kzkgFKkja n'kxqkk% l Kk AA3AA

vFK%, d] n'k] 'kr i 'pkr l gL=] v; q] bl ds i 'pkr-y{k] iz q] dkfV] vch] vCt] [ko] fu[ko] bl ds i 'pkr-egkl jkst] 'kōq] l fjrkā fr vFKkz~l enz i 'pkr-vUR;] e/;] ijk/kz; s0e'k% n'kxqkkkjk l d; kvka dsuke gA ijorhZ xf.krKka us; g ukedj .k yxHkx dk; e j [kk gA l d; kvka dseku bl idkj g&

, de-	1	10 ⁰
n'ke-	10	10 ¹
'kre-	100	10 ²
l gl=	1000	10 ³
v; r~	10000	10 ⁴
y{k	100000	10 ⁵
iz r~	1000000	10 ⁶
dkv	10000000	10 ⁷
vcñ	100000000	10 ⁸
vçt	1000000000	10 ⁹
[koZ	10000000000	10 ¹⁰
fu[koZ	100000000000	10 ¹¹
egkl jkst	1000000000000	10 ¹²
'kædq	10000000000000	10 ¹³
l fjrki fr	100000000000000	10 ¹⁴
vUR;	1000000000000000	10 ¹⁵
e/;	10000000000000000	10 ¹⁶
ijk/kz	100000000000000000	10 ¹⁷

- 2- iEke l sydj Øe'k% n rd l [; kvkæds; kx dk l # Jh/kjkpk; Zusifrikfnr fd; k gA
- 3- vçdx f.krh; Jsh eafol eku l [; kvkæds oxkæds, oa?kukæds; kx dsfy, l # fn; s x; sgA bl izdkj ds l # nsukys Jh/kjkpk; Zi Eke xf.kr K gA l # bl izdkj g% l [; kvkæds oxkæds; kx dsfy, &

**f}xq.krp; si xf.kra e[kl 3xq.kra fujçxPNLFKA
dfrl 3dfyrs; qa pedfrxq.krs oxz fr%AA 105AA**

Li "Vhdj .k&

$$a^2 + (a + d)^2 + (a + 2d)^2 + \dots + n \text{ in }]$$

$$= a[a + (a + 2d) + (a + 4d) + \dots + n \text{ in }]$$

$$+ d[1^2 + 2^2 + 3^2 + 4^2 + \dots + (n-1) \text{ in }]$$

l [; kvkæds ?kukæds; kx dsfy, %

**JshQyL; oxz ip; grs 1p; 1/2 foghuonuxqkeA
ewQyo/k fun; kn"VKfnp; si /ku; kx%AA 107AA**

$$= a^3 + (a + d)^3 + (a + 2d)^3 + \dots + n \text{ in}$$

$$= S^2 d + S.a.(a - d)$$

$$= a^3 + (a+d)^3 + (a+2d)^3 + \dots + n$$

tgk $S = \frac{n}{2} [2a + (n-1)d]$

- 4- **oxl I ehdj.k gy djus dh fof/k%oxl** ehdj.k gy djus dh Jh/kjkpk; Z dh fof/k dks oržeku ea oxl i j d i) fr (Completing the square) dsuke I s tkuk tkrk gA Hkk" dj kpk; Z us Jh/kjkpk; Z dk mYy{ k dj rsgq ; g 'yk d fn; k g&

prjkgroxl I eS : i % i {k} ; a xqk; sA

v0; DroxZ i \$ D r k S i {k S r r k s enyeAA

[HkkL dj kpk; J chtxf.kr idj.k 8 'yk d 4]

vFkZ % ekuk fd oxl I ehdj.k $ax^2 + bx = c$ gA nksuka i {kka dks $4a$ I s xqkk djus ij

$$4a^2x^2 + 4abx = 4ac$$

$$\text{nksuka i {kka ea } b^2 \text{ tkM/ us ij } 4a^2x^2 + 4abx + b^2 = 4ac + b^2$$

$$\Rightarrow (2ax + b)^2 = 4ac + b^2$$

$$\Rightarrow 2ax + b = \pm \sqrt{4ac + b^2}$$

$$\Rightarrow x = \frac{-b \pm \sqrt{4ac + b^2}}{2a}$$

- 5- T; kfefr ea Jh/kjkpk; Z dk ; ksnku%

d- oUk [k.M dk {k=Qy

[k- ?kukHk dk vk; ru

x- I eoUkh; cyu dk vk; ru

?k- 'k d q d s vk; ru

bu I c ds I = f = 'f r d k ea fo | eku gA Jh/kjkpk; Z ds x d f k , d svkykd LrEHk dh Hkkfr jgsftuds i dk' k ea i j o r h z fo } k u k a u s v i u h j p u k , j i L r r d h A

cāxqr %28 bD½ I s HkkL dj kpk; Z %150bD½ ds e/; ea Jh/kjkpk; Z %50bD½ tkToY; eku u{k= FkA bl fy, dgk x; k gSfd&

mUj r k s I j f u y ; a n f { k . k r k s e y ; i o z a ; k o r A

i b x i j n f / k e / ; s u k s x . k d % J h / k j k n u ; % A A

vFkZr-mUj ea fgeky; I snf{k.k dsey; ioz rd vks i o z v k s i f' peh I enz dh I hek ea Jh/kj dh rnyuk dk dkbZ xf.krK ughagA

