

छत्तीसगढ़ माध्यमिक शिक्षा मण्डल, रायपुर



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i z u cfd

1/0 | k\$pr bdkb1/2

NÜkhl x<+ek/; fed f'k{k k e.My] jk; i j

# vkedk

jk"Vh; i kB; p; kZ dh : i js[kk 2005 eaftu fpUrkvka dk mYys[k fd; k x; k gSml dsrkjrE; eain'sk dsgkbZdny , oagk; j l dsMjh eav/; ; u djusokysfo | kFFkz ka ds l aak eafopkj djus , oa mudh l eL; kvka dk l ek/kku djus graq NRRhl x<+ek/; fed f'k{kk e.My iz Ru'khy g\$ rkd 'k\$kf.kd y{; ka dh i kflr gks l ds , oa f'k{kk dh xqkoRrk ea l qkkj gks l da


ijh{kkvka ds l e; fo | kFFkz ka ds eu eafpUrK , oa Hk; mRiUu gsrk gSfd ijh{kk ds h gksch\ ijh{kk eafdl idkj izu i Ns tk; a\$ dks l k izu ijh{kk dsfy, egROIwKz gks l drsg\$ bl graq foxr o"ka eae.My iz kl jr jgk g\$ fo"K; okj ekMy izu i = dks vc NRRhl x<+ek/; fed f'k{kk e.My ds ekU; rk i klr fo | ky; ka ea Hkstus ds l kFk&l kFk mUga e.My ds os l kbV ea ykM fd; k tk; xka ijh{kk ds Hk; , oaruko l seDr j [kus dsfy, e.My }kjk gkbZLdny , oagk; j l dsMjh ds fo | kFFkz ka ds fy, fo"K; okj d{kk 9oha l s 12ohard izu cid r\$ kj fd; k x; k g\$ izu cid ea ijEijxR izuka ds vrfjDr uohu izuka dk l eko\$K fd; k x; k g\$ izu cid bdkbdkj , oae.My dh ijh{kk ; kstuk ds vuq kj r\$ kj fd; k x; k g\$ ftl l s vPNs vad i klr djus ds l kFk&l kFk ijh{kkFFkz ka ea fo"K; ds ifr : fp mRiUu gkschA

izu cid ds vHkko eaf'k{kdk} i k' udka vK\$ fo | kFFkz ka dks i kB; i qrd ds vUr eafn; s x, ijEijxR izuka ij fuHkz jguk i M\$K g\$ bl l sfo"K; dk eW; ka du 0; fDrijd (Subjective) gks tkrk g\$ rFk fofHkUu 'k\$kf.kd mI\$; ka ds vk/kkj ij eW; ka du ugha gsrk g\$ bl h vko'; drk dks /; ku ea j [krs gq e.My us gkbZdny 1/9oh 10oh rFk gk; j l dsMjh 1/11oh 12oh ds l Hk fo"K; ds izu cid dk fuekZk fd; k g\$ bl izu cid l s f'k{kdk} , oa fo | kFFkz ka ea fur uohu izuka ds fuekZk dh vHk: fp mRiUu gkschA

izu cid ea fo"K; dh mi yC/k 'k\$kd l kexh dks 'kkfey fd; k x; k g\$ bl ea uohu ek\$yd izuka d\$ fo"K; oLrj f'k{k.k dsmI\$; ] dfBukbZLrj vK\$ vadu dh xqkoRrk ds vuq kj l q afBr djdsj [kk x; k g\$ izu cid eae.My dh ijh{kk ; kstuk ds vuq kj vfry?kqUkjh; ] y?kqUkjh; , oa nh?kzUkjh; izuka dk l eko\$K fd; k x; k g\$ ifr; ksch ijh{kk dsfy, vH; kl graqoLrj"b izuka dk Hk l eko\$K izu cid eafd; k x; k g\$ ftl l s ifr; ksch ijh{kkvka ds vH; kl ea l gk; rk feyschA ifrfnu] ifr l lrg] ifrekg vK\$ ifro"Kz uohu izuka ds ckjs ea fo | kFFkz k\$ f'k{kdk} i k' udka ijh{kdk vK\$ l keU; tu l sfo"K; okj e.My uohu izuka dks vkef=r fd; k tkoskA vki ds }kjk i\$kr fo"K; okj uohu izuka dks tkM\$elj ifro"Kz izu cid dk l ak\$ku e.My }kjk fd; k tkosk] ftl l s izu cid vf/kd ifjiwKz vK\$ vk/k\$udre gks s jg\$

ep\$vk'kk gSfd e.My }kjk tkjh izu cid fo | kFFkz k\$ f'k{kdk} i k' udka , oa ijh{kdk dsfy, mi ; ksch fl ) gkschA

'k\$kdkeukvka l fgr---

  
1/4s feat 1/2  
vkbz, -, l -

I fpo

N-x- ek/; fed f'k{kk e.My] jk; ij

# bdkbz & 1

## chtxf.kr

vfr y?kpnÜkjh; izu

izu 1&  $i + \frac{1}{i}$  dk eku Kkr dlft; s A

izu 2& I ffeJ I ĩ; k  $\sqrt{3+i}$  dk eki kad , oa dkskad Kkr dlft; s A

izu 3& ;fn  $1, w, w^2$  bdkbz ds ?kueny gis rns fl ) dlft; s fd  $(1+w^2)^5 = -w^2$

izu 4& 125 dk ?ku eny Kkr dlft; s A

izu 5& Jskh  $\frac{2}{9}, \frac{4}{17}, \frac{1}{4}$  ..... dk 7oka in Kkr dlft; s A

izu 6& I ĩ; k; a 16 vĳ 20 dk gjkRed ek/; Kkr dlft; s A

izu 7& Jskh  $\frac{1}{3}, -\frac{1}{6}, \frac{1}{12}$  ..... dk vkBoka in Kkr dlft; s A

izu 8& Jskh  $1, \sqrt{3}, 3$  ..... dk dku lk in 81 gS A

izu 9& Jskh  $1 + 2 + 4 + \dots$  ds nl inka dk ;lxQy Kkr dlft; s A

izu 10&  $\frac{1}{4}$  vĳ 64 dk xqkkRrj ek/; Kkr dlft; s A

izu 11& Jskh  $1 - \frac{1}{3} + \frac{1}{9} - \frac{1}{27}$  ..... ds vur inks dk ;lxQy Kkr dlft; s A

izu 12& fl ) dlft; s fd &  $3^{\frac{1}{2}} \times 3^{\frac{1}{4}} \times 3^{\frac{1}{8}} \times \dots \infty = 3$

izu 13& I ehdj.k gy dlft; s %&

$$xy = 10$$

$$yz = 5$$

$$zx = 2$$

izu 14&  ${}^n P_{n-2} = 60$  gis rls  $n$  dk eku Kkr dlft; s A

izu 15&  $12P_r = 1320$  gis rls  $r$  dk eku Kkr dlft; s A

izu 16& ;fn  ${}^n C_{12} = {}^n C_{18}$  gis rls  $n$  dk eku Kkr dlft; s A

izu 17& ;fn  ${}^{10}C_r = {}^{10}C_{r+4}$  gis rls  ${}^5C_r$  dk eku Kkr dlft; s A

izu 18&  $(2x+3y)^5$  ds il kj ea ml jk in Kkr dlft; s A

izu 19&  ${}^{15}C_1 + {}^{15}C_2 + {}^{15}C_3 + \dots + {}^{15}C_{15}$  dk eku Kkr dlft; s A

izu 20&  $\frac{e^1 - e^{-1}}{2}$  dh Jskh fyf[k; s A

izu 21&  $e^{-2x}$  dk il kj  $x$  ds ?krha ds vkjgh Øe ea vJ dlft; s A

izu 22& fl ) dlft; s fd &  $\log\left(\frac{3}{2}\right) = \frac{1}{2} - \frac{1}{2 \cdot 2^2} + \frac{1}{3 \cdot 2^3} - \frac{1}{4 \cdot 2^4} + \dots$

y?kmlkj; izu

izu 1&  $x$  vkj  $y$  ds eku Kkr dlft; s A

$$2 + (x + yi) = 3 - i$$

izu 2&  $(a + ib)$  ds : i ea idV dlft; s A

$$\frac{5-3i}{6+i}$$

izu 3& I fEJ I ; k  $2-3i$  dk ml ds I a qeh I s ; kxQy rFkk xqkuQy Kkr dlft; s A

izu 4&  $\frac{3+4i}{3i}$  dk xqku ifryke Kkr dlft; s A

izu 5&  $\frac{1-i}{1+i}$  dk I a qeh Kkr dlft; s A

- izu 6& fl) dlft; s  $\frac{1+i}{1-i} = i$
- izu 7&  $\sqrt{3} + i$  dks /oph; : i ea 0; Dr dlft; s A
- izu 8&  $3 + 4i$  dk oxey Kkr dlft; s A
- izu 9& fl) dlft; s fd  $\sqrt{15+8i} + \sqrt{15-8i} = 8$
- izu 10& ;fn  $1, w, w^2$  bdkbl ds ?kueny gks rks fl) dlft; s fd  $(1+w^2) + (1+w^2)^3 = -2$
- izu 11& ;fn  $x = a, y = bw, z = cw^2$  gks rks fl) dlft; s  $\frac{x}{a} + \frac{b}{b} + \frac{z}{c} = 0$
- izu 12& l fEeJ l d; kvka  $3i, 3+2i, 2-i$  dks fu: fir djus okys fclnq;ka l s fu: fir f=Hkqt dk {k=Qy Kkr dlft; s A
- izu 13& ;fn vkjxM vkj;[k ij fclnq p l fEeJ l d; k  $z = x + iy$  dks fu: fir djrk gS rks p dk fclnq iFk Kkr dlft; s tcf d  $\arg. (z - 2 - 3i) = \frac{\pi}{4}$
- izu 14& oxl l ehdj.k  $x^2 + 13 = 4x$  dks gy dlft; s A
- izu 15& ;fn gjkRed Jskh dk 7oka in rFkk 13oka in Ø'e'k%  $\frac{1}{34}$  v;g  $\frac{1}{64}$  gS rks Jskh dk 30oka in Kkr dlft; s A
- izu 16& gjkRed Jskh  $\frac{1}{2}, -\frac{1}{3}, -\frac{1}{8}$  ..... ds n inka dk ;lxQy Kkr dlft; s A
- izu 17&  $\frac{9}{2}$  v;g  $\frac{3}{2}$  ds chp rhu gjkRed in Kkr dlft; s A
- izu 18& ;fn  $a, b, c$  gjkRed Jskh ea gks rks fl) dlft; s fd  $\frac{1}{b-a} + \frac{1}{b-c} = \frac{2}{6}$
- izu 19& fdl h xqkkrj Jskh ea iFke in  $a = \frac{1}{2}$  l kol vujkr  $r = 2$  rFkk noka in 32 gks rks n dk eku Kkr dlft; s A
- izu 20& Jskh  $4 + 44 + 444 + \dots$  dk n inka rd ;lxQy Kkr dlft; s A

izu 21& Jskh  $\frac{2}{9}, -\frac{1}{3}, +\frac{1}{2}$  ..... ds fdrus inka dk ; kxQy  $\frac{55}{72}$  gS A

izu 22& ml vur xqkkRj Jskh dk ; kxQy Kkr dhft; s ftl dk pkFkk in  $\frac{2}{3}$   
vkj l krola in  $\frac{2}{81}$  gS A

izu 23&  $\frac{1}{3}$  vkj 432 ds chp rhu xqkkRj ek/; in fuof'kr dhft; s A

izu 24& nks l [; kvka dk l ekRj ek/; 10 vkj xqkkRj ek/; 8 gS A l [; k; a Kkr dhft; s A

izu 25& xqkkRj Jskh ds rhu l [; kvka dk xqkuQy 216 rFkk muds oxka dk ; kxQy 133 gS A mu l [; kvka dks Kkr dhft; s A

izu 26& Jskh ds  $n$  inka dk ; kxQy Kkr dhft; s ftudk  $n$  oka in  $n^2 + n$  gS A

izu 27& l ehdj.k gy dhft; s &

$$(x+y)(y+z)=30$$

$$(y+z)(z+x)=18$$

$$(z+x)(x+y)=15$$

izu 28& rhu eul; , d jy fMccs ea ?kj rs ga ftl ea 5 l lva [kkyh gS A crkb; s os fdrus izkj l s cB l drs ga A

izu 29& fl ) dhft; s fd &  $2np_n = 2^n \{1.3.5 \dots (2n-1)\}$

izu 30& ;fn  $9p_5 + 5.9p_4 = 10p_r$  gks rks  $r$  dk eku Kkr dhft; s A

izu 31& BHOPAL ds v{kjka dks Øe ea j [kus l s fdrus 'kcn cu l drs ga pgs dkbz 'kcn fujFkd gh D; ka u gks \

izu 32& vad 1] 3] 5] 7] 9 ea l s fdrus gh vadks dks ycdj fdruh l [; k; a cu l drh gS tcf d fdl h l [; k ea dkbz vad nqjk u vk; s A

izu 33& DAUGHTER 'kcn ds v{kjka l s fdrus 'kcn cuk; s tk l drs ga tcf d  
 $\frac{1}{2}$  Loj l nb l kfk jga \

½ Loj dHh l kFk u jga \

- izu 34& vad 3] 4] 5] 6] 7] 8 l s fdruh l [; k; a cu l drh gS tks fd 3000 rFk 4000 ds chp fLFkr gks rFk vdzka dh i qjkoFRr u gks A
- izu 35& MATHEMATICS 'kCn ds l Hkh v{kjka dks , d l kFk ydj fdrus Øep; cuk; s tk l drs gā muea l s fdrus ea Loj , d l kFk gks A
- izu 36& , d iDr ea 5 yMels vj 3 yMfd; ka fdrus izdkj l s cBk; s tk l drs gā tcf d dkbz nks yMfd; k ikl & ikl u gka A
- izu 37& crkb; s 5 iq Ldkj 4 yMelks ea dgy fdrus izdkj l s ck/s tk l drs gā tcf d iR; d yMelk fdrus Hkh iq Ldkj ys l drk gS A
- izu 38& fdl h l febr ds 15 l nL; xly est ds pkjka vj fdrus izdkj l s cB l drs gā ; fn ea-h l Hkifr ds ck; ha vj cBs vj mie-h nk; ha vj \
- izu 39& , d d{kk ea 20 fo | kFkZ gā A nks d{kk i fruf/k; ka dk puko djuk gS A ; g puko fdrus izdkj l s gks l drk gS A
- izu 40& 8 0; fDr; ka ds l Eesyu ea ; fn iR; d 0; fDr , d nh js l s , d gh ckj gkFk feyk; s rks gkFk feykus dh dgy l [; k Kkr dhft; s A
- izu 41& 8 iq "k vj 4 efgykva ea l s 5 l nL; ka dh , d l febr cukuh gS crkb; s ; g fdruh fof/k; ka l s cuk; h tk l drh gā tcf d iR; d l febr ea  
½ dgy , d efgyk yh tk; s \  
½ de l s de , d efgyk yh yk; s \
- izu 42& , d 'kkyk ea dgy 12 f[kyMh gS ftuea l s 9 f[kyM+ ka dh Vhe ppuh gā ; fn dlrku l nk ogh j[kuk gS rks Vhe fdrus izdkj l s ppuh tk l drh gā
- izu 43& fdl h l ery ea 12 fclnq gā ftuea l s 5 fclnq , d l jy j[kk ea fLFkr gā A crkb; s fd bu fclnqka dks feykus l s ½ fdruh l jy j[kk; a ½ fdrus f=kkqt cu l drs gā A
- izu 44& 7 dkyh xn rFk 5 l Qn xnka dks , d iDr es fdrus izdkj l s tek; k tk l drk gS ; fn dkbz Hkh nks l Qn xns l kFk & l kFk u jga \ , d gh jak dh l c xns l eku gS A
- izu 45& 10 0; atuka vj 4 Lojka ea l s 3 0; atu vj 2 Loj ydj fdrus fofkku 'kCn

cuk; a tk l drs gā A

izu 46& 42 fihku fihku i q rda 6 fo | kfkz ka ea cjkj & cjkj fdrus izkj l s cka/h tk l drh gS \

izu 47& ejs 7 fe= gā A mlga fdrus izkj l s pk; i kvz ea vkef=r dj l drk gW A

izu 48& 9 fo" k; ka dh , d ijk( k ea i R; d fo" k; ea mRrh. kz gks ds fy; s fuEure vad fu/ kkr gS A , d Nk= fdrus izkj l s vuqrh. kz gks l drk gS A

izu 49&  $\left(\frac{4}{3}x^2 - \frac{3}{2x}\right)^9$  ds i l kj ea e/; in Kkr dlft; s A

izu 50&  $\left(x^2 + \frac{1}{x}\right)^{11}$  ds i l kj ea  $x^7$  dk xqkd Kkr dlft; s A

izu 51&  $\left(x^2 + \frac{1}{x}\right)^{12}$  ds i l kj ea vpj in Kkr dlft; s A

izu 52& fl ) dlft; s fd &

$$C_1 + 2C_2 + 3C_3 + \dots + nC_n = n \cdot 2^{n-1}$$

izu 53&  $(1-x^2)^{\frac{7}{3}}$  dk i l kj 4 inka rd dlft; s A

izu 54& fl ) dlft; s &

$$\lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n = e \quad ; \text{fn } n > 1$$

izu 55& Jskh  $\sum_{n=1}^{\infty} \frac{(n, 2)}{n+1}$  dk ; kxQy Kkr dlft; s A

izu 56& fl ) dlft; s fd &

$$2 \log_e n - \log_e (n+1) - \log_e (n-1) = \frac{1}{n^2} + \frac{1}{2n^4} + \frac{1}{3n^6} + \dots$$

izu 57& fl ) dlft; s fd 
$$\frac{1 + \frac{1}{\underline{2}} + \frac{1}{\underline{4}} + \frac{1}{\underline{6}} + \dots \infty}{1 + \frac{1}{\underline{3}} + \frac{1}{\underline{5}} + \frac{1}{\underline{7}} + \dots \infty} = \frac{e^2 + 1}{e^2 - 1}$$



nh?kz mRrjh; izu

izu 1& I fEeJ I a; k  $z = x + iy$  dk fcUnq i Fk Kkr dhft; s ; fn  
 $|z + 4i| + |z - 4i| = 10$

izu 2& fl ) dhft; s fd &

$$\sqrt{a + ib} + \sqrt{a - ib} = \sqrt{2 \left[ \sqrt{a^2 + 6^2} + a \right]}$$

izu 3& fl ) dhft; s fd &

$$x^3 + y^3 + z^3 - 3xyz = (x + y + z)(x + wy + w^2z)(x + w^2y + wz)$$

izu 4& gjkRed Jskh dh rhu I a; k; lva dk ; lx 11 gS rFkk muds vuøela dk ; lx  
1 gS A I a; k; a Kkr dhft; s A

izu 5& a vj b nks jkf'k; ka ds I ekUrj ek/; vj gjkRed ek/; ka ea  $m : n$  dk  
vujkr gS rks fl ) dhft; s fd  $\frac{a}{b} = \frac{\sqrt{m} + \sqrt{m - n}}{\sqrt{m} - \sqrt{m - n}}$

izu 6& ; fn  $a^x = b^y = c^z$  vj a, b, c xqkRrj Jskh ea gks rks fl ) dhft; s x, y, z  
gjkRed Jskh ea gks A

izu 7& a vj b nks jkf'k; ka ds xqkRrj vj gjkRed ek/; ka ea  $m : n$  dk vujkr  
gS rks fl ) dhft; s fd  $\frac{a}{b} = \frac{m + \sqrt{m^2 - n^2}}{m - \sqrt{m^2 - n^2}}$

izu 8& fuEu Jskh dk noka in rFkk ninka dk ; lxQy Kkr dhft; s

$$2.5 + 3.8 + 4.11 + 5.14 + \dots$$

izu 9& Jskh  $1 + \frac{1}{1+2} + \frac{1}{1+2+3} + \frac{1}{1+2+3+4} + \dots$  dk ninka dk ; lxQy  
Kkr dhft; s A

izu 10& I ehdj.k gy dhft; s &

$$x^2 + xy + xz = 18$$

$$y^2 + yz + yx = 12$$

$$z^2 + zx + zy = 30$$

izu 11& I ehdj.k gy dlft; s &

$$x + y + z = 9$$

$$xy + yz + zx = 23$$

$$x y z = 15$$

izu 12& fl ) dlft; s fd &

$$C_0^2 + C_1^2 + C_2^2 + \dots + C_n^2 = \frac{2n}{(\underline{n})^2}$$

izu 13& f}in iæš dh l gk; rk l s  $(624)^{\frac{1}{4}}$  dk eku n'keyo ds plj LFkkura rd  
Kkr dlft; s A

izu 14& fl ) dlft; s fd  $(1+x)^{p+q}$  ds i l kj ea t g k l l p v l j q ?ku i k k d g s  $x^p$   
v l j  $x^q$  ds x q k k d c j k c j g s A

izu 15& fl ) dlft; s fd  $e^{e^x}$  ds fo l r j ea  $x^n$  dk x q k k d  $\frac{1}{\underline{n}} \left[ \frac{1^n}{\underline{1}} + \frac{2^n}{\underline{2}} + \frac{3^n}{\underline{3}} + \dots \dots \dots \infty \right]$   
g s A

izu 16& fl ) dlft; s fd &

$$\frac{1}{\underline{1}} + \frac{1+3}{\underline{2}} x + \frac{1+3+5}{\underline{3}} x^2 + \frac{1+3+5+7}{\underline{4}} x^3 + \dots \dots \dots \infty = e^x (x+1)$$

izu 17& ;fn  $y = 1 - \frac{x}{\underline{1}} + \frac{x^2}{\underline{2}} - \frac{x^3}{\underline{3}} + \dots \dots \dots$  v l j  $z = -y - \frac{y^2}{\underline{3}} - \frac{y^3}{\underline{3}} + \dots \dots \dots$

g s r k s fl ) dlft; s fd  $x = -\log_e (1 - e^z)$

izu 18& fl ) dlft; s fd &  $\frac{2}{\underline{1}} + \frac{7}{\underline{2}} + \frac{15}{\underline{3}} + \frac{26}{\underline{4}} + \frac{40}{\underline{5}} + \dots \dots \dots \infty = \frac{7e}{2}$

izu 19& fl ) dlft; s fd  $\log_e^2$  dk eku 0-616 r Fk 0-76 ds e/; g s A

&&&00&&&

## bdkbz & 2 ¼=dks kfefr½

### 1- f=dks kferh; Qyu

vfr y?kpnÜkjh; izu

izu 1& ,d f=Hkqt ds rhuka dsk l ekUrj Jskh ea gS ;fn egrre dsk 90° dk gls rks U;ure dsk Kkr dhft; s A

izu 2& ,d orr dh f=T;k 7 l eh gS A ml pki dh yEckbz Kkr djks tks orr ds dñnz ij 30° dk dsk vaxr djrk gS A

izu 3&  $\sin(45+x) + \sin(45-x)$  dk eku Kkr dhft; s A

izu 4& fdl h l edsk f=Hkqt ds nks U;u dskka ds ekula dk varj  $\frac{\pi}{9}$  jfM; u gS A mu dskka ds eku vak ea 0; Dr dhft, A

izu 5& ;fn  $\cos \theta = \frac{3}{5}$  rks  $\tan \theta + \sec \theta$  dk eku Kkr dhft, A

y?kpnÜkjh; izu

izu 1& fl ) djks fd &

$$\frac{\cos 12 + \sin 12}{\cos 12 - \sin 12} = \tan 57$$

izu 2& fl ) djks fd  $\sin(A+B) \sin(A-B) = \sin^2 A - \sin^2 B$

izu 3& ;fn gls rks fl ) djks fd  $(1 + \tan A)(1 + \tan B) = 2$

izu 4& ;fn  $\sin \theta + \cos \theta = m$  vkj  $\sec \theta + \csc \theta = n$  rks fl ) dhft, fd  $(m+1)(m-1)n=2$

izu 5& fl ) dhft; s fd &

$$4 \sin A \cdot \sin(60-A) \sin(60+A) = \sin B A$$

nh?kz mRrjh; itu

itu 1& fl ) dlft; s fd &

$$\sin 10^\circ \sin 30^\circ \sin 50^\circ \sin 70^\circ = \frac{1}{16}$$

itu 2& fl ) dlft; s fd &

$$\frac{\sin (A-B) + \sin A + \sin (A+B)}{\cos (A-B) + \cos A + \cos (A+B)} = \tan A$$

itu 3& ;fn  $\tan \theta + \sin \theta = m$  vs  $\tan \theta - \sin \theta = n$  gl rls fl ) dlft, fd  
 $m^2 - n^2 = 4 \sqrt{mn}$

&&&00&&&

## bdkbz & 2 ¼=dks kfefr½

2- f=dks kferh; I oñ fedk, a xkQ , oa I ehdj.k

vfr y?kñÙkj; i zu

izu 1&  $3 \cos x$  dk vk; ke Kkr dlft, A

izu 2& I ehdj.k  $\sin \theta = \frac{1}{2}$  ds eq; eku Kkr dlft, A

izu 3& ;fn  $\tan \theta + \sin^2 \theta = \sin^2 \alpha$  rks  $\theta$  dk 0; ki d eku fyf[k, A

izu 4& ;fn  $\tan \theta = 1$  rks  $\theta$  dk 0; ki d gy fyf[k, A

izu 5& ;fn  $3 \cot^2 \theta = 1$  rks I ehdj.k gy dlft, A

y?kñÙkj; i zu

izu 1& ;fn  $A + B + C = \pi$  gks rks fl ) dlft, fd %

$$\cos A + \cos B + \cos C = 1 + 4 \sin \frac{A}{2} \sin \frac{B}{2} \sin \frac{C}{2}$$

izu 2& ;fn  $A + B + C = \pi$  gks rks fl ) dlft, fd %

$$\cos^2 \frac{A}{2} + \cos^2 \frac{B}{2} - \cos^2 \frac{C}{2} = 2 \cos \frac{A}{2} \cos \frac{B}{2} \cos \frac{C}{2}$$

izu 3& ;fn  $\sin 3 \theta = \sin \theta$  dk eku Kkr dlft, A

izu 4& ;fn  $A + B + C = 2S$  gks rks fl ) dlft, fd

$$\sin (S-A) \sin (S-B) + \sin (S-C) \sin S = \sin A \sin B$$

izu 5& I ehdj.k  $\sin^4 \theta + \cos^4 \theta = \frac{1}{2}$  dks gy dlft, A

izu 6& I ehdj.k  $\sqrt{3} \sin \theta - \cos \theta = \sqrt{2}$  dks gy dlft, A

nh?kz mRrjh; itu

itu 1& I ehdj.k  $5\cos\theta + 2\sin\theta = 2$  dks gy dlft,] tcf

$$\cot 21^\circ 48' = \frac{5}{2}$$

itu 2& I ehdj.k  $\sin 2x + \sin 4x + \sin 6x = 0$  dks gy dlft, A

itu 3& I ehdj.k  $\sin 4\theta = \cos 3\theta + \sin 2\theta$  dks gy dlft,

itu 4& ;fn  $\sin \theta = \sin \alpha$  gks rks fl ) dlft, fd

$$\sin \frac{\theta}{3} = \sin \left[ \frac{n\pi}{3} + (-1)^n \frac{\alpha}{3} \right]$$

&&&00&&&

## bdkbz & 2 ¼ = dks kfefr½

### 3- f=Hkqt ks ds xqk/keZ

vfr y?kpnÜkjh; izu

izu 1& ;fn  $\Delta ABC$  ea  $\angle A = 30^\circ$   $\angle B = 60^\circ$  gis rks  $a : b$  dk eku Kkr dhft, A

izu 2& ;fn  $\Delta ABC$  ea  $b = \sqrt{3}$   $c = 2$  rFkk  $\angle A = 60^\circ$  gis rks  $\tan\left(\frac{B-C}{2}\right)$  dk eku Kkr dhft, A

izu 3& fdl h  $\Delta ABC$  ea ;fn  $a + b + c = 2s$  rks  $\cos \frac{A}{2}$  dk eku fyf[k, A

izu 4& ml f=Hkqt dk {s=Qy Kkr dhft, ftl ea  $c = \sqrt{3}$   $b = 1$  rFkk  $\angle A = 60^\circ$

izu 5& ;fn fdl h f=Hkqt dh Hkqt k, a 18] 24 vif 30 l eh gS rks ml dh ifj=T;k Kkr dhft, A

y?kpnÜkjh; izu

izu 1& fl) djs fd  $\sin\left(\frac{A-B}{2}\right) = \frac{a-b}{c} \cos \frac{C}{2}$

izu 2& ;fn  $\Delta ABC$  ea  $\frac{a}{\cos A} = \frac{b}{\cos B}$  gS rks fl) dhft, fd

$$2 \sin A \cos B = \sin C$$

izu 3& ,d f=Hkqt dh Hkqt k, a 7]  $4\sqrt{3}$  vif  $\sqrt{13}$  ehVj gS A l cl s Nk/k dsk Kkr dhft, A

izu 4&  $\Delta ABC$  ea fl) dhft, fd  $\frac{a - C \cos B}{b - C \cos A} = \frac{\sin B}{\sin A}$

izu 5& ea fl) dhft, fd  $\cot \frac{A}{2} \cot \frac{C}{2} = \frac{a+b+c}{a-b+c}$

nh?kZ mRrjh; izu

izu 1& ;fn  $a, b, c$  l ekUrj Jsh ea gks rks fl ) dhft, fd  $3 \tan \frac{C}{2} = 1$

izu 2& ;fn fdl h  $\Delta ABC$  ea vk/kj BC ea fLFkr fclnq D vk/kj dks  $m:n$  ea vr% folkkftr djrk gS rFkk  $\angle BAD = \alpha$ ,  $\angle DAC = \beta$ ,  $\angle ADC = \theta$  rks fl ) dhft, fd  $(m+n) \cot \theta = m \cot \alpha - n \cot \beta$

izu 3& fdl h  $\Delta ABC$  ea fl ) dhft, fd &

$$(b+c-a) \cot \frac{B}{2} + \cot \frac{C}{2} = 2a \cot \frac{A}{2}$$

izu 4& fdl h  $\Delta ABC$  ea ;fn  $(b+c+a)(b+c-a) = 3bc$  gks rks fl ) dhft, fd  $\angle A = 60^\circ$

&&00&&&



## bdkbz & 2 $\frac{1}{2}$ = dks kfefr $\frac{1}{2}$

### 4- Áþkbz vísj njih

vfr  $y^?k\pi\dot{U}kj$ ; izu

izu 1& ,d m/okzkj ehukj ds vk/kkj ls 20 ehVj njih ij fLFkr fclnq ls ml dh pVh dk mlu; u dsk  $45^\circ$  gS ehukj dh Áþkbz Kkr dhft, A

izu 2& ;fn fdl h [kEHs dh ijNkbz ml dh Áþkbz ds cjkj gks rks ml {k.k l  $\pi$  Z dk mlu; u dsk Kkr dhft, A

izu 3& ;fn fdl h {k.k 0; fDr dh ijNkbz dh yeckbz 'k'; gks rks ml {k.k l  $\pi$  Z dk mlu; u dsk Kkr dhft, A

$y^?k\pi\dot{U}kj$ ; izu

izu 1& 10 l eht  $f=T$ ; k dh ,d xkykdj xn /kjry ij j[kh gS rFkk /kjry ds ,d fclnq  $A$  ij  $60^\circ$  dk dsk vrfjr djrh gA fclnq  $A$  dh xkys ds dlnz ls njih Kkr dhft, A

izu 2& fdl h ehukj dh pVh dk /kjry ds fdl h fclnq ij mlu; u dsk  $30^\circ$  gA ehukj dh vísj 20 ehVj pyus ij ;g  $60^\circ$  gks tkrk gS A ehukj dh Áþkbz Kkr dhft, A

nh?kZ mRrjh; izu

izu 1& ,d ehukj {krt /kjry ij [kMh gS nks fclnq/ka ls ftuea feykus okyh j[kk vk/kkj ls gkdj tkrh gS rFkk tks vk/kkj ls a vísj b njih ij gS A f'k[kj ds mlu; u dsk  $\text{Øe}'k\% \alpha$  vísj  $90 - \alpha$  gA rks fl ) dhft, fd ehukj dh Áþkbz  $\sqrt{ab}$  gskh A

izu 2& l h/kh {krt l Mel ls m/okzkj fLFkr gokbz tgtk ls l Mel ds nks Øekxr iRFkja ea tks gokbz tgtk ds nkska vísj fLFkr gS voueu dsk  $\alpha$  vísj  $\beta$

g) fl) djks fd l Mel l s gokbz tgkt dh  $\frac{1}{\cot \alpha + \cot \beta}$  gS A

izu 3&

,d ehukj ds f'k[kj ij >.Mk yxk gqk gS ftl dh yEctbz a gS A ;fn  
{kSrt Hkfe ds fd l h fclnq ij ehukj vj >.Mk Øe'k%  $\alpha$  vj  $\beta$  dks k  
cukrs gS rks fl) dft, fd ehukj dh  $\frac{1}{\sin \alpha \cos (\alpha + \beta) \operatorname{cosec} \beta}$   
gS A

&&&00&&&

## bdkbz & 3

funzkkad T; kfefr , oa f=foe funzkkad T; kfefr

vfr y?kqñÜkjh; izu

izu 1& nks fclnq/ka ds chp dh njh dk l = fyf[k; s A

izu 2& ml js[tk dk l ehdj.k Kkr dhft, tks  $\gamma$  v{k ds l ekdrj gS rFkk bl v{k l s  $\frac{-4}{5}$  bdkbz dh njh ij gA

izu 3& js[tk  $3x-4y=12$  dh id.krk rFkk  $\gamma$  v{k ij dkVs x; s vr%[k.M dks Kkr dhft, A

izu 4& ey fclnq l s , d js[tk ij  $\perp$  dh yEckbz 5 bdkbz gS rFkk ; g yEc  $\gamma$  v{k ds l kfk  $-60^\circ$  dk dsk cukrk gS A js[tk dk l ehdj.k Kkr dhft, A

izu 5& rhu l jy js[tkvka ds l xeu dk ifrcak fyf[k; s A

izu 6& D;k js[tkvka  $y-3x-7=0$  vsj  $3y-x-8=0$  ds chp dk dsk U; w dsk gA dkj.k Li"V dhft, A

izu 7& ;fn  $y=m_1x+c_1$  js[tkvka dh l ehdj.k  $y=m_2x+c_2$  rFkk ds yEcor gkus dk ifrcak fyf[k; s A

izu 8& ey fclnq 40] 0% l s js[tk  $ax+by+c=0$  ij yEc dh yEckbz Kkr dhft, A

izu 9& ml js[tk dk l ehdj.k Kkr dhft, tks js[tk; s  $x-y-6=0$  rFkk  $7x-5y=36$  ds ifrPNn fclnq dks ey fclnq l s feykrh gS A

izu 10& fo|kyh; l e?kkr l ehdj.k  $ax^2+24xy+by^2=0$  l s inf'kr js[tkvka ds yEcor gkus dk ifrcak fyf[k; s A

izu 11& js[tk  $x-y=0$  vsj  $x-4y=0$  l s inf'kr l a Ør js[tk dk l ehdj.k Kkr dhft, A

izu 12& og ifrcak fyf[k, tc f}?kkrh; l ehdj.k dk 0; ki d l ehdj.k nks l jy js[tkvka dks fu: fir djs A

- izu 13& oRr ftl dk dñnz  $\frac{1}{h}, k \frac{1}{2}$  rFkk  $f=T; k$  gA ml oRr dk l ehdj.k fyf[k; s tks  $x$  v{k dks Li 'kz djrk gS A
- izu 14& oRr  $x^2 - y^2 + 2gy + 2fy + c = 0$  }kjk  $x$  v{k ij dkVk  $x; k$  vr% [k.M dk l = fyf[k; s A
- izu 15& oRr  $x^2 + y^2 = 1$  dks ikpfyd : i ea 0; Dr dhft, A
- izu 16& ifrcak fyf[k; s tc j[kk  $x^2 + y^2 = 2a$  oRr  $y = mx + c$  dks Li 'kz djs A
- izu 17& ml ijoy; dk l ehdj.k fyf[k; s ftl dk v{k  $x$  v{k 'kh'kz  $(a, 0)$  rFkk fu; rk  $\gamma$  v{k gS A
- izu 18& 'a' ds fdl eku ds fy; s ijoy;  $y^2 = 4ax$  fcnq  $(5, -3)$  l s xqtjxk A
- izu 19& ni?kbrR  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$  ea thok dh yckbz dk l = crkb; s tc  $b^2 < a^2$
- izu 20& ni?kbrR  $\frac{x^2}{16} + \frac{y^2}{9} = 1$  dh mRdñnrk Kkr dhft, A
- izu 21& l edkf.kd vfr ijoy; fdl s dgrs gA A l edkf.kd vfrijoy; dh mRdñnrk dk eku fyf[k; s A
- izu 22& fcnq  $(1, 0, 2)$  dh  $\chi^2$  l ery l s njih Kkr dhft, A
- izu 23& fcnq  $(3, 2, -4)$  vsj  $(9, 8, -10)$  ds chp dh njih Kkr dhft, A
- izu 24& ml f=Hkqt ds dñnd ds fun'kkad fyf[k; s ftuds 'kh'kz  $(x_1, y_1, z_1)$   $(x_2, y_2, z_2)$  vsj  $(x_3, y_3, z_3)$  gS A
- izu 25& oRr  $x^2 + y^2 = a^2$  }kjk l jy j[kk  $y = mx + c$  ij vr% [kMr thok dh yckbz dk l = fyf[k; s A

y?kñkjh; izu

- izu 26& ,d fcnq bl idkj xfr djrk gS fd ey fcnq l s ml dh njih l nñ 5 bñkbz ds cjkj jgrh gA rks bl ds fcnq iFk dk l ehdj.k Kkr dhft, A

- izu 27& bl pj fcnq dk fcnq Fk dk l ehdj.k Kkr dhft, ftl dh  $x$  v{k ,oa  $\lambda$  v{k l s cjkj njih ij gS A
- izu 28& js[kk  $3x - \sqrt{3}y + 1 = 0$  dh id.krk Kkr dhft, A
- izu 29& ;fn js[kk; s  $7x - 5y = 12$  rFkk  $5x + py = 4$  ,d nh js ds yEcor gS rks  $p$  dk eku crkb; s A
- izu 30& Ijy js[kk  $3x - \sqrt{3}y - 18 = 0$  }kjk v{kks l s dks x; s var% [km Kkr dhft, A
- izu 31& ml Ijy js[kk dk l ehdj.k Kkr dhft, ftl ij eny fcnq l s yEc dh yckbz 3 bdkbz rFkk ;g yEc  $x$  v{k ds l kfk /kukRed fn'kk ea  $-30^\circ$  dk dsk cukrh gS A
- izu 32& js[kk  $\sqrt{3}x - 3y - 5 = 0$  rFkk  $x$  v{k ds chp dk dsk Kkr dhft, A
- izu 33& l ekhrj js[kkvka  $y = mx + c$  rFkk  $y = mx + c'$  ds chp dh njih Kkr dhft, A
- izu 34& ml ifrcdk dks Kkr dhft, ftl l s Ijy js[kk  $ax + by + c = 0$  nksuka v{kka l s cjkj dsk cukrh gS A
- izu 35& ml Ijy js[kk dk l ehdj.k Kkr dhft, tks  $y - x - 1 = 0$  rFkk  $2x - y + 1 = 0$  ds ifrPNn fcnq l s gkdj tkrh gS rFkk js[kk  $3x + 2y = 0$  ij yEc gS A
- izu 36& l ehdj.k  $x^2 - 7xy + 12y^2 = 0$  l s inf'kr js[kkvka ds chp dk dsk Kkr dhft, A
- izu 37& js[kk ;ke  $x^2 - 2xy \sec \theta + y^2 = 0$  }kjk fu: fir js[kkvka ds e/; dskka dh v)bl js[kvka ds l ehdj.k Kkr dhft, A
- izu 38& l ehdj.k  $6x^2 - 8xy - 8y^2 + 23x - 10y + 7 = 0$  }kjk inf'kr js[kkvka ds chp dk dsk Kkr dhft, A
- izu 39& l ehdj.k  $x^2 + 2hxy - 2y^2 = 0$  }kjk inf'kr nks v)bla ea l s ,d v)bl dk l ehdj.k  $x - 2y = 0$  gS rks  $\lambda$  dk eku Kkr dhft, A
- izu 40& R=f=T;k dk oRr f}rh; prfkk ea fLFkr gS A ;fn oRr nksuka v{kka dks Li'kz djrk gS rks oRr dk l ehdj.k Kkr dhft, A

- izu 41& ml oRr dk lehdj.k Kkr dhft, ftl dh  $f=T$ ; k a gS vlg tks x v{k dks ey fcnq ij Li'kz djrk gS A
- izu 42& ;fn j[kk  $x+2by+7$  oRr  $x^2+y^2-6x+2y=0$  dk ,d 0; kl gks rks b dk eku Kkr dhft, A
- izu 43& f=Hkqt ABC ea dksk C l edsk gS ;fn fcnq A vlg B ds funktad Øe'k%  $(-3, 4)$  vlg  $(3, -4)$  gks f=Hkqt ABC ds ifjxr oRr dk lehdj.k Kkr dhft, A
- izu 44& ey fcnq l s oRr  $x^2+y^2-2ax-2by+b^2=0$  ij [kph xbz Li'kz j[kkva ds ijLij yEcor gkus dk vko'; d 'krl Kkr dhft, A
- izu 45& ;fn  $\left(m_i, \frac{1}{m_i}\right)$  tc  $m_i > 0, i = 1, 2, 3, 4$  pkj iFkd iFkd fcnq ,d oRr ij gks rks n'kzb; s fd  $m_1m_2m_3m_4=1$ .
- izu 46& oRr  $x^2+y^2=a^2$  dh mu thokva ds e/; fcnq dk fcnqFk crkb; s tks dñz ij l edsk vlrkfjr djrh gS A
- izu 47& ijoy;  $y^2=4x$  dh ukflkyE thok dh yEckbz Kkr dhft, A
- izu 48& ,d ijoy; ftl dk lehdj.k  $y^2=4ax$  gS A bl ijoy; ij fLFkr fdl h fcnq  $(x_1, y_1)$  dh ukflkdh; njh Kkr dhft, A
- izu 49& ;fn j[kk  $x=1$  ijoy; ftl dk lehdj.k  $y^2-kx+8=0$  dh fu;rk gA rks K dk eku Kkr dhft, tgla K dk eku /kukRed gS A
- izu 50& nh?kzRr dk lehdj.k  $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$  gS A bl nh?kzRr ij fLFkr fdl h fcnq dh ukflkdh; nfj; ka dk ;ksx vpy gS rFkk nh?kz v{k ds cjkj gsrk gS A fl) dhft, A
- izu 51& nh?kzRr dk lehdj.k  $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$  tgkW  $b^2=a^2(1-e^2)$  ;fn  $b=a$  rks nh?kzRr dk lehdj.k  $x^2+y^2=a^2$  gks tkrk gS A ;g ml oRr dk lehdj.k gS ftdl k dñz  $(0,0)$  f=T; k a gS A rks crkb, D; k oRr dh fu;rk vur ij fLFkr gksxh A

- izu 52& ml ni?kbrR dk l ehdj.k Kkr dhft, ftl dk dlnz ey fclnq ij gS ukfllk; ka  $(1,0)$  rFkk  $(-1,0)$  gS vj mRdlnrk  $\frac{1}{2}$  gS A
- izu 53& ml ni?kbrR dh mRdlnrk Kkr dhft, ftl dh ukfllk; ka ds chip dh njh ukfllkyEc dh thok dh yEckbz ds cjkcj gS A
- izu 54& 30 lseh yEch ,d NM<sub>AB</sub> nks yEc v{k ij bl izdkj fQl yrk gS fd NM+dk ,d fljk ,d v{k ij vj njk fljk nj js v{k ij jgrk gS A NM+ ds fclnq N dk fcnqFk Kkr dhft, ftl s AN vj BN ds chip vuqkr 1:2 dk vuqkr jgs A
- izu 55& ml vfr ijoy; dh mRdlnrk Kkr dhft, ftl dk ukfllkyEc l a keh v{k dk vk/kk gS A
- izu 56& js[kkvla  $bx+ay=abt$  rFkk  $bx-ay=\frac{ab}{t}$  gS A bu js[kkvla ds ifrPNn fcnq dk fcnqFk Kkr dhft, \
- izu 57& ,d pki ijoy; ds : i ea gS ftl dk v{k m/okZkj gS A pki 10 ehVj Apk ,oa vk/kkj ij 5 ehVj pkmk gS A vk/kkj ds dlnz l s 2 ehVj dh njh ij pki dh Apkbz Kkr dhft, A
- izu 58& fdl h 0; fDr P dks dlnz ds ?kMs T dks nckus dh /ofu vj y; S l s xkyh 2 djkus dh /ofu ,d l kFk l qkbz nrh gS A rks crkb; s fd P dk fcnqFk ,d vfrijoy; gSxk A ftl dh ukfllk; ka T rFkk S gS A
- izu 59& fdl h f=llqt PQR ds dlnz ds funzkkad Kkr dhft, ;fn P, Q, R ds funzkkad  $\text{Øe'k} (x_1, y_1, z_1) (x_2, y_2, z_2)$  rFkk  $(x_3, y_3, z_3)$  gS A
- izu 60&  $\gamma$  v{k ij og fcnq Kkr dhft, tks fcnq/ka  $(3, 1, 2)$  rFkk  $(5, 5, 2)$  l s l enjLFk gS A
- izu 61& ,d /kkod j dkl l ds pkjka vj nkm+jgk gS A /kkod ;g n[krk gS fd nks /ot LrEhka dh nj; ka dk ;lx l n 10 ehVj jgrk gS vj /ot LrEhka ds chip dh njh 8 ehVj gS A nkmus ds ekxl ij {k=Qy oxl ehVj ea Kkr dhft, A
- izu 62& ni?kbrR dh y?k{ ds /ukRed fl js l s gkdj tkus okyh thokva ds e/; fcnq/ka dk fcnqFk Kkr dhft, A

nh?kZ mRrjh; izu

izu 1& ,d n.M ftl dh yEckbz '1' gS A nks yEcor NMks ds chp bl izkj l jdrh gS fd bl ds fl js l nb bu NMka ij jgrs gS A n.M dh e/; fcnq dk fcnq Fk Kkr dhft, A

izu 2& ;fn fdl h f=Hkqt ds 'k'kkz ds funkktad i wkkad gS rks fl ) dhft, fd ;g ,d l eckgq f=Hkqt ugha gks l drk A dFku dh 0; k[; k dhft, A

izu 3& fl ) dhft, fd j[kk; a  $y = mx + c$  rFkk  $x \cos x + y \sin x = p$  ,d gh j[kkvka dks 0; Dr djrs gS ;fn  $c = p\sqrt{1+m^2}$

izu 4& ,d pj j[kk ij ey fcnq l s Mkys x; s yEc dh yEckbz P gS rFkk X v{k dh /ukRed fn'kk ds l kFk dsk  $\alpha$  cukrk gS A ;fn  $\alpha$  pj rFkk P vpj jk'k gS rks bl j[kk }jkj v{kka ds chp dkVs x; s Hkkx ds e/; fcnq dk fcnq Fk Kkr dhft, A

izu 5& ;fn  $a, b, c$  l -Js ea gS rks fl ) dhft, fd l jy j[kk  $ax + 2by + c = 0$  geskk fLFkj fcnq  $(1, -1)$  l s gkclj xqjsh A

izu 6& K ds fdl eku ds fy; s j[kk; a  $y = (2 + \sqrt{3})x + 4$  rFkk  $y = kx + 6$  ,d nh js l s  $30^\circ$  ds dsk ij >ph gbl gS A

izu 7& ;fn  $y = x + \gamma$  rFkk  $x^2 + y^2 = 1$  ds ifrPNn fcnvka ds ey fcnvka l s feykus okyh j[kk; a ijLij yEc gks rks  $\gamma$  dk eku Kkr dhft, A

izu 8& f}kkrh; l ehdj.k dk 0; ki d l ehdj.k  $ax^2 + 2hxy + by^2 + 2gx + c = 0$  l s fu: fir l jy j[kkvka ds ijLij l ekUrj gkus dk ifrcak Kkr dhft, A

izu 9& ;fn l ehdj.k  $y^2 + \lambda xy - x^2 \tan \theta = 0$  ij inf'kr j[kkvka ds chp dk dsk  $2Q$  gks rks  $\lambda$  dk eku Kkr dhft, A

izu 10& ml oRr dk l ehdj.k Kkr dhft, ftl dh f=T; k 10 gS rFkk bl dh nks 0; kl ka ds l ehdj.k  $x + y = 6$  rFkk  $x + 2y = 4$  gS

izu 11& A rFkk B nks fLFkj fcnq gS rFkk j[kk [kM AB fdl h vpj fcnq P ij l nb fLFkj dsk  $\alpha$  cukrk gS A rks crkb; s B D; k fcnq P dk fcnq Fk ,d oRr gksk A



- izu 12& j[tk  $lx+my+n=0$  v[ $x^2+y^2=a^2$  oRr ds Li'kz gkus dk ifrcak Kkr dhft, ,oa Li'kz fcnq ds fun[tkad Kkr dhft, A
- izu 13& mu oRrka ds d[uz dk fcnq Fk Kkr dhft, tks oRrka  $x^2+y^2=a^2$  v[ $x^2+y^2=4ax$  dks ckg; r% Li'kz djrs gS A
- izu 14& fl) dhft, fd fcnq (4,3) l s oRr  $x^2+y^2=9$  ij [kph xbz Li'kz j[tkvka rFkk mudh Li'kz thok }kjk fufe[ f=kkqt dk {k=Qy  $7\frac{17}{25}$  oxl b[tkbz gA
- izu 15& nh?kBRr ds y?kq v{k ds ,d fl js dh ukth; njih k gS rFkk ukth; ka ds chp dh njih  $2h$  gS A rks v/k[ka dh yEckbz ka Kkr dhft, A
- izu 16& ml nh?kBRr dk lehdj.k Kkr dhft, tks fcnvka (-3,1) v[ $(2,-2)$  l s gkdj tkrk gS rFkk ftl dk d[uz ey fcnq ij gS A nh?kBRr dh mRd[urk dh Kkr dhft, A
- izu 17& ml vfrijoy; dk lehdj.k Kkr dhft, ftl dh ukth; ka ds chp dh njih 8 rFkk fu; rkvka ds chp dh njih 6 gS A
- izu 18& ijoy;  $y^2=4ax$  ij dkbz fcnq P gS rFkk ml dh fu; rk ij yEc PM gA P, M rFkk ukth S ,d leckgq  $\Delta$  ds 'k'kz gS A P ds fun[tkad Kkr dhft, A
- izu 19& 20 l set- yEch Mjsh ds fl js 16 l set- dh njih ij flFkr nks fcnvka ij ycs gS A ml pj fcnq l s vuj[kr nh?kBRr dh mRd[urk rFkk ukthkyEc Kkr dhft, ftl ij Mjsh ruh jgrh gS A
- izu 20& ;fn fd l h nh?kBRr vftl dk nh?kzk  $x$  v{k o d[uz ey  $\frac{1}{2}$  ea ukth; ka dks y?kq v{k ds ,d fl js l s feykus okyh j[tkvka ds chp dk dks l edsk gS rks ml dh mRd[urk Kkr dhft, ;fn nh?kzk dh yEckbz  $2\sqrt{2}$  gS rks nh?kBRr dk lehdj.k Kkr dhft, A

&&00&&

## bdkbz & 4 I kf[; dh

vfr y?kpnÜkjh; izu

izu 1& I ekUrj ek/; dh ifjHkk"kk fyf[k, A

izu 2& ;fn 5] 8] x] 14 dk I ekUrj ek/; 7 gis rts x dk eku Kkr dhft, A

izu 3& iFke ikp fo"ke ikdfrd I [; kvka dh ekf/; dk Kkr dhft, A

izu 4& 3 Is folHkT; iFke pkj ikdfrd I [; kvka dh ekf/; dk Kkr djks A

izu 5& cgyd ds nks xqk fyf[k, A

izu 6& cgyd dh mi; kfxrk crkb;s A

y?kpnÜkjh; izu

izu 7& fuEu I kj.kh Is I ekUrj ek/; Kkr dhft, A

x	3	5	8	6	9	7
f	6	3	5	4	7	5

izu 8& fuEu I kj.kh Is vKkr ckjEckjrk dk eku Kkr dhft,] tcfD I ekUrj ek/; 6-5 gS A

vkadM\$	8	3	9	7	4
ckjEckjrk	4	5	f	3	2

izu 9& fuEu I kj.kh Is ekf/; dk Kkr dhft, A

x	7	8	9	10	11	12	13
f	2	1	5	4	6	1	3

izu 10& fuEu I kj.kh I s cgyd I enhdj.k fof/k I s Kkr dhft, A

i klrkd	10	20	30	40	50	60	70	80
ckjEckjrk	3	4	8	6	7	8	4	5

nh?kz mRrjh; izu

izu 1& fuEu I kj.kh I s ekud fopyu Kkr dhft, A

oxl	0 - 4	4 - 8	8 - 12	12 - 16	16 - 20
vkofr	6	10	12	10	8

izu 2& fuEufyf[kr I kj.kh I s cgyd Kkr dhft, A

oxkkrj	0-10	10-20	20-30	30-40	40-50	50-60	60-70
ckjEckjrk	5	18	30	45	40	15	10

izu 3& fuEu I kj.kh I s ekf/; dk dh x.kuk dhft, A

oxkkrj	30 -35	35-40	40-45	45-50	50-55	55-60	60-65
ckjEckjrk	14	16	18	23	18	8	3

izu 4& fuEu I kj.kh I s I ekkrj ek/; Kkr dhft, A

i klrkd	fo   kffkz ka dh I d; k
80 I s de	100
70 I s de	90
60 I s de	80
50 I s de	60
40 I s de	32
30 I s de	20
20 I s de	13
10 I s de	5

&&00&&

# bdkbz & 5

## I fn'k chtxf.kr

vfr y?kpnÜkjh; itu

itu 1& 0; Øe I fn'k fdl s dgrs gñ ,oa mnkgj.k Hkh fyf[k, A

itu 2& fdl h I fn'k  $\vec{a}$  dk bdkbz I fn'k Kkr dhft, A

itu 3& P vsj Q ds fLFkr I fn'k Øe'k%  $3i+5j-7k$  rFkk  $3l-4j+k$  gSA  $|\overline{PQ}|$  Kkr dhft, A

itu 4& fclnq%ka  $2\vec{a}-3\vec{b}$  rFkk  $3\vec{a}-2\vec{b}$  dks feykus okyh js[kk dks 2:3 ea vlr% fohkDr djus okys fclnq dk fLFkr I fn'k Kkr dhft, A

itu 5& pkj fclnq%ka A, B, C, D ds fLFkr I fn'k Øe'k%  $\vec{a}, \vec{b}, 2\vec{a}+3\vec{b}, \vec{a}-2\vec{b}$  gks rks I fn'k  $\overline{AC}$  dk eku Kkr dhft, A

y?kpnÜkjh; itu

itu 6& fdl h prhkt ABCD ds fod.kZ AC rFkk BD gñ rks fl ) dhft, fd  $\overline{AB} + \overline{DC} = \overline{AC} + \overline{DB}$

itu 7& ;fn G,  $\Delta ABC$  dk dhnd gñ rks fl ) dhft, fd  $\overline{GA} + \overline{GB} + \overline{GC} = \vec{0}$

itu 8& fl ) dhft, fd I fn'k  $\vec{a}-2\vec{b}+3\vec{c}, -2\vec{a}+3\vec{b}-4\vec{c}, -\vec{b}+2\vec{c}$  I eryh; gñ

itu 9& I fn'kka  $3i+4j+5k, 4i-3j-5k$ , vsj  $7i+j$  I s cus f=Hkt dk ifjeki Kkr dhft, A

itu 10& ABCD ,d I ekrj prhkt gñ A AC vsj BD bl ds fod.kZ gñ A fl ) dhft, fd  $\overline{AC} + \overline{BD} = 2\overline{BC}$

nh?kz mRrjh; izu

izu 11& A vsj B nls fclnq gS A fclnq A dk fLFkfr I fn'k  $6\vec{a}-2\vec{b}$  gS A dkbZ fclnq P ftl dk fLFkfr I fn'k  $\vec{a}-\vec{b}$  gS AB dks 1:2 ea foHkDr djrk gS rks B dk fLFkfr I fn'k Kkr dlft, A

izu 12& fl ) dlft, fd og f=Hkqt ftl ds 'Hkqt' ds fLFkfr I fn'k Øe'k%  $i-2j+3k$ ;  $-l-j+8k$  vsj  $-4i+4j+6k$  gS A ,d I eckgq f=Hkqt gS A

izu 13& m vsj n ds eku Kkr dlft, ;fn  $\vec{a}=2\vec{l}+3\vec{j}+9\vec{k}$ ;  $\vec{b}=m\vec{l}+n\vec{j}+2\vec{k}$  rFkk  $a\parallel b$

&&&00&&&

## bdkbz & 6 ydyu 'kkL=½

### Qyu] I hek rFkk I karR;

vfr y?kqñÜkjH; itu

itu 1& ;fn  $f(x) = x^2 + 2x \sin x + 3$ , rks fl ) dhft, fd  $f(x)_3 x$  dk ,d I e Qyu gS A

itu 2&  $f(x) = \frac{|x-4|}{x-4}$  dk Mkesu Kkr dhft, A

itu 3& ;fn  $f(x) = \cos^2 x + \sin x$  gks rks  $f(\pi - x)$  dk eku crtb; s A

itu 4& ;fn  $f(x) = \sin, x \in R$  rFkk  $g(x) = x^2, x \in R$  rks  $f \circ g(x)$  dk eku Kkr dhft, A

itu 5&  $\lim_{x \rightarrow 5} \frac{x^3 - 125}{x - 5}$  dk eku Kkr dhft, A

itu 6&  $\lim_{x \rightarrow 8} \frac{(2x-3)(3x-4)}{(4x-5)(5x+6)}$  dks Kkr dhft, A

y?kqñÜkjH; itu

itu 7& ;fn  $f(x) = \begin{cases} 1, & x < 0 \\ -1 & x > 0 \end{cases}$  rks fl ) dhft, fd  $\lim_{x \rightarrow 0} f(x)$  dk vflrRo ugha gS A

itu 8& fl ) djks fd  $f(x) = \begin{cases} x^2, & tC \ x \neq 1 \\ 2 & tC \ x = 1 \end{cases}$   $x=1$  ij vl rrr gS A

itu 9& ;fn  $f(x) = x$  vkSj  $g(x) = \frac{1}{x}$  gks rks fl ) dhft, fd  $f\{g(x)\} = g\{f(x)\}$ .

izu 10& ;fn  $\lim_{x \rightarrow 2} \frac{x^n - n^2}{x - 2} = 80$  rFkk  $n$  ,d /ku iukid gk rks  $x$  dk eku Kkr dhit, A

izu 11& fl ) djs fd  $\lim_{x \rightarrow 0} \frac{\sin^{-1} x}{x} = 1$

nh?kz mRrjh; izu

izu 12&  $\lim_{x \rightarrow 0} \frac{e^x - e^{-x}}{\sin x}$  dk eku Kkr dhit, A

izu 13&  $K$  dk eku Kkr dhit, ;fn  $f(x) = \begin{cases} \frac{1 - \cos 4x}{8x^2}, & x \neq 0 \\ K & x = 0 \end{cases}$  fclnq  $x = 0$  ij

I rr g\$ A

izu 14&  $\lim_{x \rightarrow 0} \frac{\tan 3x - 2x}{3x - \sin^2 x}$  dk eku Kkr dhit, A

&&&00&&&

bdkbz & 7 ¼ puk i ksj kfxdh½  
dEl; Wj ds cfu; knh fl ) kUr

vfr y?kpnÜkjh; itu

itu 1& ^dEl; Wj dk firK\*\* fdl s dgk tkrk gS A

itu 2& ckbujh uEcj D; k gS A

itu 3& igkMk fpi fdl us cuk; k Fkk A

itu 4& ABCDEF dk gDI k Ml hey ea eku D; k gS A

itu 5& oyyWkby dk 'kkfCnd vFkZ D; k gS A

y?kpnÜkjh; itu

itu 1& fMftVy dEl; Wj D; k gS A bl s fdrus Jf.k; ka ea cka/k x; k gS A

itu 2& fl LVe l kVVoş j D; k gS A bl l s gea D; k egRoikZ tkudkjh feyrh gS A

&&&00&&&



vfr y?kpnÜkjh; izu

izu 1&  $-2 + 5i$  dk xqku ifryke Kkr dhft, A

izu 2&  $i + \frac{1}{i}$  dk eku Kkr dhft, A

izu 3&  $\sqrt{3} + i$  dks /kph; : i es fyf[k, A

izu 4& 625 ds prf[kz eny Kkr dhft, A

izu 5& bdkbz ds prf[kz enyka ds eku fyf[k, A

izu 6& ;fn ,d gjkRed Jskh dk iFke in  $a$  v[; f}rh; in  $b$  gS rks Jskh dk nok; in Kkr dhft, A

izu 7& Jskh  $2, 2\frac{1}{2}, 3\frac{1}{3}, \dots$  dk pkf[kk in Kkr dhft, A

izu 8& 4 v[; 9 dk xqkkRj ek/; Kkr dhft, A

izu 9& iFke  $r$  le l[; kvka dk ;kxQy Kkr dhft, A

izu 10& fl ) dhft; s fd  $9^{\frac{1}{3}} \times 9^{\frac{1}{9}} \times 9^{\frac{1}{27}} \times \dots \infty = 3$

izu 11& nks jkf'k; ka dk l kettRj ek/;  $\frac{13}{2}$  gS rFkk gjkRed ek/;  $\frac{72}{13}$  gS rks mudk xqkkRj ek/; D; k gkskA

izu 12& l ehdj.k gy dhft,  $xy = 2, yz = 3, zx = 6$ .

izu 13& ,d d{kk ea 20 fo|kfhz gA fdrus izkj l s ,d ekhhVj dks p[uk tk l drk gA

izu 14& f=kkqt  $ABC$  dks fdrus izkj l s fy[k l drs gA

izu 15& ;fn  ${}^{15}P_r = 2730$  gks rks  $r$  dk eku Kkr dhft, A

izu 16& 100 v[; 1000 ds chp fdruh l[; k, a 1] 2] 3] 4] 5] 6 v[; 7 l s cukbz tk l drh gA

izu 17& INDIA 'kCn ds v{kjka dks ydj fdrus fhkku&fhkku 'kCn cu l drs gA

izu 18& 6 Qyka dh ekyk dks fdruh fof/k; ka l s xfk tk l drk gA

izu 19& ,d d{kk ea 20 fo |kFkhz gA 2 d{kk ifrfuf/k; ka dk ppuko djuk gA ; g ppuko fdrus izdkj l s gks l drk gA

izu 20&  $(2x + 3y)^4$  dk foLrkj dhft, A

izu 21&  ${}^{20}C_1 + {}^{20}C_2 + {}^{20}C_3 + \dots + {}^{20}C_{20}$  dk eku Kkr dhft, A

izu 22&  $e^{2x}$  dk izkj  $x$  dh c<rh gbl ?kkrka ea dhft, A

izu 23&  $(1-2x)^{-1}$  dk izkj 5 inka rd dhft, A

izu 24& fl ) dhft, fd  $1 + \frac{1}{2} + \frac{1.3}{4} + \frac{1.3.5}{6} + \dots \infty = e.$

izu 25& fl ) dhft, fd  $\frac{1}{2.3} + \frac{1.3}{4.5} + \frac{1.3.5}{6.7} + \dots \infty = 1 - \log_e 2$

y?kq mkrjh; izu

izu 26& Jskh ds  $n$  inka dk ; kxQy Kkr dhft; s ftudk  $n$  oka in  $n^2 + n$  gS A

izu 27& l ehdj.k gy dhft; s &

$$(x + y)(y + z) = 30$$

$$(y + z)(z + x) = 18$$

$$(z + x)(x + y) = 15$$

izu 28& rhu euq; ,d jy fMcs ea ?kq rs gA ftl ea 5 l hVa [kkyh gS A crkb; s os fdrus izdkj l s cB l drs gA A

izu 29& fl ) dhft; s fd &  $2np_n = 2^n \{1.3.5 \dots (2n-1)\}$

izu 30& ;fn  $9p_5 + 5.9p_4 = 10p_r$  gks rks  $r$  dk eku Kkr dhft; s A

izu 31& BHOPAL ds v{kjka dks Øe ea j [kus l s fdrus 'kCn cu l drs gA pgs dkbz 'kCn fujFkd gh D; ka u gks \

izu 32& vad 1] 3] 5] 7] 9 ea l s fdrus gh vadks dks yad j fdruh l [; k; a cu l drh gS tcf d fdl h l [; k ea dkbz vad nqkj u vk; s A

izu 33& DAUGHTER 'kCn ds v{kjka l s fdrus 'kCn cuk; s tk l drs gA tcf d

$\frac{1}{2}$  Loj l nb l kFk jga \

½ Loj dHh l kFk u jga \

- izu 34& vad 3] 4] 5] 6] 7] 8 l s fdruh l [; k; a cu l drh gS tks fd 3000 rFk 4000 ds chp fLFkr gks rFk vdzka dh i qjkoFRr u gks A
- izu 35& MATHEMATICS 'kCn ds l Hkh v{kjka dks , d l kFk ydJ fdrus Øep; cuk; s tk l drs gā muea l s fdrus ea Loj , d l kFk gks A
- izu 36& , d iDr ea 5 yMels vj 3 yMfd; ka fdrus izdkj l s cBk; s tk l drs gā tcf d dkbz nks yMfd; k ikl & ikl u gka A
- izu 37& crkb; s 5 i q Ldkj 4 yMelks ea dJy fdrus izdkj l s cBk; s tk l drs gā tcf d iR; d yMelk fdrus Hkh i q Ldkj ys l drk gS A
- izu 38& fdl h l febr ds 15 l nL; xly est ds pkjka vj fdrus izdkj l s cB l drs gā ; fn ea-h l Hkifr ds ck; ha vj cBs vj mie-h nk; ha vj \
- izu 39& , d d{kk ea 20 fo | kFkZ gā A nks d{kk i fruf/k; ka dk puko djuk gS A ; g puko fdrus izdkj l s gks l drk gS A
- izu 40& 8 0; fDr; ka ds l Eesyua ea ; fn iR; d 0; fDr , d nh js l s , d gh ckj gkFk feyk; s rks gkFk feykus dh dJy l [; k Kkr dhft; s A
- izu 41& 8 i q "k vj 4 efgykva ea l s 5 l nL; ka dh , d l febr cukuh gS crkb; s ; g fdruh fof/k; ka l s cuk; h tk l drh gā tcf d iR; d l febr ea  
½ dJy , d efgyk yh tk; s \  
½ de l s de , d efgyk yh yk; s \
- izu 42& , d 'kkyk ea dJy 12 f[kyMh gS ftuea l s 9 f[kyM+ ka dh Vhe ppuh gā ; fn dlrku l nk ogh j[kuk gS rks Vhe fdrus izdkj l s ppuh tk l drh gā
- izu 43& fdl h l ery ea 12 fclnq gā ftuea l s 5 fclnq , d l jy j[kk ea fLFkr gā A crkb; s fd bu fclnq/ka dks feykus l s ½ fdruh l jy j[kk; a ½ fdrus f=Hkt cu l drs gā A
- izu 44& 7 dkyh xn rFk 5 l Qn xnka dks , d iDr es fdrus izdkj l s tek; k tk l drk gS ; fn dkbz Hh nks l Qn xns l kFk & l kFk u jga \ , d gh jak dh l c xns l eku gS A

izu 45& 10 0; atuka vlg 4 Lojka ea l s 3 0; at u vlg 2 Loj yd j fdrus fo fkl u 'kcn cuk; a tk l drs gā A

izu 46& 42 fkl u fkl u i q rda 6 fo | kfkz ka ea cjkj & cjkj fdrus izkj l s cka/h tk l drh gS \

izu 47& ejs 7 fe= gā A mlga fdrus izkj l s pk; i kvz ea vkef=r dj l drk gWA

izu 48& 9 fo" k; ka dh , d i j h { k k ea i R; d fo" k; ea mkrh. kz gkus ds fy; s fuEure vod fu/kl jr gS A , d Nk= fdrus izkj l s vuq rh. kz gk l drk gS A

izu 49&  $\left(\frac{4}{3}x^2 - \frac{3}{2x}\right)^9$  ds il kj ea e/; in Kkr dlft; s A

izu 50&  $\left(x^2 + \frac{1}{x}\right)^{11}$  ds il kj ea  $x^7$  dk xqkd Kkr dlft; s A

izu 51&  $\left(x^2 + \frac{1}{x}\right)^{12}$  ds il kj ea vpj in Kkr dlft; s A

izu 52& fl ) dlft; s fd &

$$C_1 + 2C_2 + 3C_3 + \dots + nC_n = n \cdot 2^{n-1}$$

izu 53&  $(1-x^2)^7$  dk il kj 4 inka rd dlft; s A

izu 54& fl ) dlft; s &

$$\lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n = e \quad ; \text{fn } n > 1$$

izu 55& Jskh  $\sum_{n=1}^{\infty} \frac{C(n,2)}{|n+1|}$  dk ; l x Qy Kkr dlft; s A

izu 56& fl ) dlft; s fd &

$$2 \log_e n - \log_e (n+1) - \log_e (n-1) = \frac{1}{n^2} + \frac{1}{2n^4} + \frac{1}{3n^6} + \dots$$

izu 57& fl ) dlft; s fd

$$\frac{1 + \frac{1}{\underline{2}} + \frac{1}{\underline{4}} + \frac{1}{\underline{6}} + \dots \infty}{1 + \frac{1}{\underline{3}} + \frac{1}{\underline{5}} + \frac{1}{\underline{7}} + \dots \infty} = \frac{e^2 + 1}{e^2 - 1}$$

nh?kz mRrjh; izu

izu 1& I fEeJ I a; k  $z = x + iy$  dk fcUnq i Fk Kkr dhft; s ; fn  
 $|z + 4i| + |z - 4i| = 10$

izu 2& fl ) dhft; s fd &

$$\sqrt{a + ib} + \sqrt{a - ib} = \sqrt{2 \left[ \sqrt{a^2 + 6^2} + a \right]}$$

izu 3& fl ) dhft; s fd &

$$x^3 + y^3 + z^3 - 3xyz = (x + y + z)(x + wy + w^2z)(x + w^2y + wz)$$

izu 4& gjkRed Jskh dh rhu I a; k; lva dk ; lx 11 gS rFkk muds vuøela dk ; lx  
1 gS A I a; k; a Kkr dhft; s A

izu 5& a vj b nks jkf'k; ka ds I ekUrj ek/; vj gjkRed ek/; ka ea  $m : n$  dk  
vujkr gS rks fl ) dhft; s fd  $\frac{a}{b} = \frac{\sqrt{m} + \sqrt{m - n}}{\sqrt{m} - \sqrt{m - n}}$

izu 6& ; fn  $a^x = b^y = c^z$  vj a, b, c xqkRrj Jskh ea gks rks fl ) dhft; s x, y, z  
gjkRed Jskh ea gks A

izu 7& a vj b nks jkf'k; ka ds xqkRrj vj gjkRed ek/; ka ea  $m : n$  dk vujkr  
gS rks fl ) dhft; s fd  $\frac{a}{b} = \frac{m + \sqrt{m^2 - n^2}}{m - \sqrt{m^2 - n^2}}$

izu 8& fuEu Jskh dk noka in rFkk ninka dk ; lxQy Kkr dhft; s

$$2.5 + 3.8 + 4.11 + 5.14 + \dots$$

izu 9& Jskh  $1 + \frac{1}{1+2} + \frac{1}{1+2+3} + \frac{1}{1+2+3+4} + \dots$  dk ninka dk ; lxQy  
Kkr dhft; s A

izu 10& I ehdj.k gy dhft; s &

$$x^2 + xy + xz = 18$$

$$y^2 + yz + yx = 12$$

$$z^2 + zx + zy = 30$$

**izu 11& I elhdj.k gy dlft;s &**

$$x + y + z = 9$$

$$xy + yz + zx = 23$$

$$x y z = 15$$

**izu 12& fl ) dlft;s fd &**

$$C_0^2 + C_1^2 + C_2^2 + \dots + C_n^2 = \frac{2n}{(\underline{n})^2}$$

**izu 13& f}in iæş dh l gk;rk l s  $(624)^{\frac{1}{4}}$  dk eku n'keyo ds plj LFkkuka rd  
Kkr dlft;s A**

**izu 14& fl ) dlft;s fd  $(1+x)^{p+q}$  ds i l kj ea t g k l l p v l j q ?ku i u k l d g s  $x^p$   
v l j  $x^q$  ds x q k l d c j k c j g s A**

**izu 15& fl ) dlft;s fd  $e^{e^x}$  ds fo l r j ea  $x^n$  dk x q k l d  $\frac{1}{\underline{n}} \left[ \frac{1^n}{\underline{1}} + \frac{2^n}{\underline{2}} + \frac{3^n}{\underline{3}} + \dots \dots \dots \infty \right]$   
g s A**

**izu 16& fl ) dlft;s fd &**

$$\frac{1}{\underline{1}} + \frac{1+3}{\underline{2}} x + \frac{1+3+5}{\underline{3}} x^2 + \frac{1+3+5+7}{\underline{4}} x^3 + \dots \dots \dots \infty = e^x (x+1)$$

**izu 17& ;fn  $y = 1 - \frac{x}{\underline{1}} + \frac{x^2}{\underline{2}} - \frac{x^3}{\underline{3}} + \dots \dots \dots$  v l j  $z = -y - \frac{y^2}{\underline{3}} - \frac{y^3}{\underline{3}} + \dots \dots \dots$**

**gls rls fl ) dlft;s fd  $x = -\log_e (1 - e^z)$**

**izu 18& fl ) dlft;s fd &  $\frac{2}{\underline{1}} + \frac{7}{\underline{2}} + \frac{15}{\underline{3}} + \frac{26}{\underline{4}} + \frac{40}{\underline{5}} + \dots \dots \dots \infty = \frac{7e}{2}$**

**izu 19& fl ) dlft;s fd  $\log_e^2$  dk eku 0-616 rFkk 0-76 ds e/; g s A**

**d{k & 11**  
**fo"k; & xf.kr**  
**bdkbz & 01 ½chtxf.kr½**

**vfr y?kqñÜkjh; izu**

¼1½  $a+ib$  dk xqku i fryke D; k gksck \

¼2½  $i^{4m+2}$  dk eku D; k gksck tcf d  $m$  /kui ððl gA

¼3½ I fEeJ I ð; k  $x+iy$  dk /kph; : i fyf[k; A

¼4½ bdkbz ds rhuka ?kuenyka ds eku fyf[k; A

¼5½  $(1+w)^3$  dk eku Kkr dhft; s tgka  $w$  bdkbz dk , d ?kueny gA

¼6½ ; fn  $a, H, b$ , gjkRed Jskh ea gks rks  $H$  dk eku  $a$  rFkk  $b$  ds inka ea fyf[k; A

¼7½ Jskh  $\frac{1}{11}, \frac{1}{9}, \frac{1}{7}$  ..... dk 7oka in Kkr dhft; A

¼8½ xqkñkj Jskh D; k gA

¼9½ Jskh 18] &6] 2 dk vxyk in , oa I kokñq kr Kkr dhft; A

¼10½ nks I ð; kvka ds chp ds I ekUrj ek/; ] xqkñkj ek/; rFkk gjkRed ek/; ea D; k I Ecðk gkrk gS \

¼11½  $n$  i kÑr I ð; kvka ds oxkð ds ; kxQy dk I ≠ fyf[k; A

¼12½ Jskh  $1-\frac{1}{2}+\frac{1}{4}-\frac{1}{8}+\dots$  ds vullr inka dk ; kxQy Kkr dhft; A

¼13½ vkoñ n'keyo D; k gkrk gS \

¼14½ I ehdj.k gy dhft; s &  $x+y, y+z=5, z+x=4$

¼15½ I e?kkr I ehdj.k fdl sdgrsgA \

¼16½ Øep; , oa I p; ea D; k vllrj gS \

¼17½ 'kCn RAM ds v{kjka I sfdrus 'kCn cu I drsgS \ pkgs 'kCn vFkñghu D; ka u gkA

¼18½ 9 f[kykfM+ ka ea I s 6 f[kykfM+ ka dh Vhe fdrus izdkj I spqñ tk I drh gA

¼19½ ijd I p; fdl sdgrsgA

120½  $(1+x)^n$  ds i d kj ea l eLr xqkkadka dk ; ksx fdruk gkrk gA

121½  $e^x + e^{-x}$  dk ekus D; k gkskA

122½ fl ) fdft; sfd &  $1 + \frac{2}{2} + \frac{3}{3} + \frac{4}{4} + \dots x = \infty$

123½ fl ) fdft; s &  $\frac{1}{1.2} + \frac{1}{3.4} + \frac{1}{5.6} + \dots \infty = \log_e 2$

124½  $10c_1 + 10c_2 + 10c_3 + \dots + 10c_{10}$  dk eku Kkr dhft; s \

125½ usi fj; u y?kx.kd , oa l k/kkj.k y?kx.kd ea D; k vlrj gS \

**y?kqYkj; izu &**

141½  $\frac{1}{3+4i}$  dks  $a+ib$  ds: i ea idV dhft; A

142½ fl ) dhft, dh  $\left(\frac{1-i}{1+i}\right)^{100} = 1$

143½  $-2+5i$  dk xqkui fryke Kkr dhft; A

144½  $-3-4i$  dk oxZny Kkr dhft, A

145½ ; fn  $1, w, w^2$  bdkbz ds?kueny gksrksfl ) fdft; sfd  $(1-w+w^2)^3 + (1+w-w^2)^3 = -16$

146½ Js  $\frac{3}{4}, \frac{3}{5}, \frac{1}{2}$  ..... dk 9 okain Kkr dhft; A

147½  $\frac{3}{7}$  vksj  $\frac{1}{4}$  dschp pkj gjkRed ek/; Kkr dhft; A

148½ nks jkf'k; ka dk l eLrj ek/; gjkRed e/; 8 gA jkf'k; ka Kkr dhft; A

149½ ml xqkRrj Jskh dks Kkr dhft, ftl dk 5 okain 80 rFk 8 okain 640 gA

1410½ fdl h xqkRrj Jskh ds  $n$  inka dk ; ksx 255 gA vfire in 128 o l kokZujfr 2 gS  $n$  dk eku Kkr dhft, A

1411½ Jskh 5 \$ 55 \$ 555 \$ ----- ds  $n$  inka dk ; ksx Qy Kkr dhft; A

1412½  $\frac{2}{3}$  vksj 486 dschp rhu xqkYkj ek/; Kkr dhft; A



1413½ nks jkf'k; ka dk l ekUrj ek/;  $\frac{13}{2}$  rFkk xqkRrj ek/; 6 gks rks mudk gjkRed ek/; Kkr dhft; A

1414½ Js kh  $2^2 + 4^2 + 6^2 + \dots$  dk  $n$  inkard ; ksxQy Kkr dhft; A

1415½ ml Js kh ds  $n$  inkard ; ksxQy Kkr dhft; sftl dk  $n$  oka in  $3n^2 + 2n$  gA

1416½ I ehdj.k gy dhft; s &  $(x+1)(y+1) = 24$   
 $(y+1)(z+1) = 28$   
 $(z+1)(x+1) = 42$

1417½ 10 dkyh o 8 l Qn xnka ea l s2 l Qn xn fdrus idkj l spqh tk l drh gA

1418½ ; fn  ${}^{56}P_{r+6} : {}^{54}P_{r+3} = 30800$  gks rks  $r$  dk eku Kkr dhft; A

1419½ 'kCn FACTORS ds v{kj ka l fdrus Øep; cu l drsgSpkgs dkbZ 'kCn fuj FkdZgh D; ka u gkA

1420½ vad 2] 3] 4] 5 vkj 6 l spkj vadks dh fdruh l a; k; a cukbZ tk l drh gS \

1421½ DOGMATIC 'kCn ds v{kj fdrus idkj l stek; s tk l drsg; ; fn Loj dk Hkh l kFk u jgA

1422½ i kp fo"k; ka dh , d ijh{k k ea i R; d fo"k; eamÙkh.kZ gks ds fy, U; ure vad fu/kkZj r gA , d ijh{k k fkhZ fdrus idkj l svuÙkh.kZ gks l drk gS \

1423½ 6 i q "k vkj 4 efgykva dks, d xksyeat dspkj kavkj fdrus idkj l scBk; k tk l drk gS ; fn dkbZ 2 efgykva , d l kFk u cBs \

1424½ fl ) fdft; s &  ${}^nC_r + {}^nC_r - 1 = {}^{n+1}C_r$

1425½ ; fn  ${}^{2n}C_3 : {}^nC_2 = 44:3$  gks rks  $r$  ds fdu ekuka ds fy,  ${}^nC_r$  dk eku 15 gkskA

1426½ 16 Hkqt k okys cgHkqt ea [khp tk l dus okys fod.kk dh l a; k Kkr dhft; A

1427½ xf.krh; vkxeu fl ) kUr l s fl ) dhft; sfd &  $1^3 + 2^3 + 3^3 + \dots + n^3 = \left[ \frac{n(n+1)}{2} \right]^2$   
 tgka  $n$  /ku i wkkZl gA

1428½  $\left( \frac{a}{x} + bx \right)^{12}$  ds il kj ea e/; in Kkr dhft; A

129½ fl ) dhft; s &  $\frac{1}{1|n-1} + \frac{1}{3|n-3} + \frac{1}{1|n-5} + \dots + \frac{2^{n-1}}{|n}$

130½ f}in iæš dh l gk; rk l s  $(624)^{\frac{1}{4}}$  dk eku n'keyo ds plj LFkkukard Kkr dhft; A

131½ fl ) dhft; s &  $\lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n = e$  ; fn  $n > 1$

132½  $\frac{e^{5x} + e^{-x}}{e^{3x}}$  dks  $x$  ds ?kkrka ds vkj kgh Øe eafyf[k; A

133½ fl ) dhft; s &  $\frac{2}{1} + \frac{2+4}{2} + \frac{2+4+6}{3} + \frac{2+4+6+8}{4} + \dots + \infty = 3e$

134½ fl ) dhft; sfd &  $\log(1+3x+2x^2) = 3x - \frac{5}{2}x^2 + \frac{9}{3}x^3 - \frac{17}{4}x^4 + \dots + \infty$

135½ fl ) fdft; sfd &  $1 + \frac{\log e^2}{2} + \frac{(\log e^2)^2}{3} + \dots = \frac{1}{\log e^2}$

**nh?kz mÜkj; i zu**

141½ l fEJ l ð; k  $z = x + iy$  dk fUnwi Fk Kkr dhft; s; fn  $\left|\frac{2-3}{2+3}\right| = 2$

142½  $1 + i\sqrt{a^2 - 1}$  dk oxèny Kkr dhft; A

143½ ; fn  $a, b, c, d$  gjkRed Jskh ea gks rks fl ) dhft; sfd  $ab + bc + cd = 3ad$

144½ ; fn fdl h xqkÿkj Jskh ds  $n$  inka dk ; kxQy  $s$ , mudk xqkuQy  $p$  rFkk muds

0; Øeka dk ; kxQy  $r$  gks rks fl ) fdft; s  $P^2 = \left(\frac{S}{R}\right)^n$

145½ rhu l ð; kvkaftudk ; kx 15 gš l ekarj Jskh ea gš ; fn muea Øe'k%1] 4 vkš 19 tkM+fn; s tk; s rks u; h l ð; k; a xqkÿkj Jskh ea gks tkrh gš l ð; k; s Kkr fdft; A

146½  $a$  vkš  $b$  nks jk'k; ka ds xqkÿkj vkš gjkRed ek/; ka ea  $m:n$  dk vuq kr gš rks fl )

fdft; sfd &  $\frac{a}{b} = \frac{m + \sqrt{m^2 - n^2}}{m - \sqrt{m^2 - n^2}}$

17½ Js kh  $1+2x+3x^2+4x^3+\dots$  dk  $n$  inkard ; kxQy Kkr dhft ; A

18½ I ehdj.k gy dhft ; s &  $x^2 - yz = a$

$$y^2 - zx = b$$

$$z^2 - xy = c$$

19½  $(1+x)^n$  ds iz kj ea xqkkad Øe'k%  $c_0, c_1, c_2, \dots, c_n$  gks rks fl ) dhft ; sfd &

$$c_0 + 2c_1 + 3c_2 + \dots + (n+1)c_n = (n+2)^{2n-1}$$

20½ ; fn  $(1+x)^n$  ds foLrkj ea 5 o 6 o r f k k 7 o a i n k a d s x q k k a d I e k U r j J s k h e a g k s r k s  $n$  dk eku Kkr dhft ; A

21½ fl ) dhft ; sfd  $(1+x)^{2n}$  ds foLrkj ea  $x^n$  dk xqkkad ds iz kj ea  $x^n$  ds xqkkad  $(1+x)^{2n-1}$  ds nqkqk gkrk gA

22½ fl ) dhft ; sfd &

$$\left[1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{6} + \dots + \infty\right]^2 = 1 + \left[1 + \frac{1}{3} + \frac{1}{5} + \frac{1}{7} + \dots + \infty\right]^2$$

23½ fl ) dhft ; sfd &  $\frac{2}{1} + \frac{7}{2} + \frac{15}{3} + \frac{26}{4} + \frac{40}{5} + \dots + \infty = \frac{7e}{2}$

24½ fl ) dhft ; sfd &  $\frac{1}{1 \cdot 2} - \frac{1}{2 \cdot 3} + \frac{1}{3 \cdot 4} - \frac{1}{4 \cdot 5} + \dots + \infty = \log_e \frac{4}{e}$

25½ ; fn I ehdj.k  $ax^2 + bx + c = 0$  ds eny  $\infty$  vkj  $\beta$  gks rks fl ) dhft ; sfd

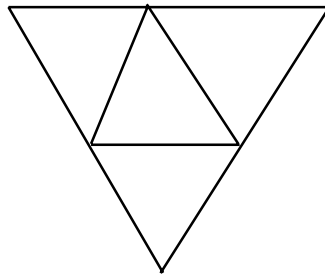
$$\log_e (a - bx + cx^2) = \log a + (\infty + \beta)x - \frac{1}{2}(\infty^2 + \beta^2)x^2 + (\infty^3 + \beta^3)x^3 + \dots$$

## 1-4 Øep; ,oa l p;

1/1½ , d d{kk ea 37 yMds vksj 24 yMfd; k; gÅ v/; ki d dksLdny dsfdl h dk; Øe ds fy, 1 yMek o 1 yMeh dksNkVuk gÅ rkscrkb, v/; ki d fdrusrjhdka l smUgaNkV l drk gÅ

1/2½ 99 l s1000 dschp fdruh , d h l æ; k, agSftuds bZdkbZLFkku ij 4 vkrk gÅ

1/3½ fdrusrjg l suhpsfn, x, fp= dksjæ fd; k tk l drk gStcfd jæ Hkjusdh mi jkDr 'kræfuEu gÅ



1/4½ dkbZHkh Nk&k f=Hkqt fdl h Hkh , d jæ uhykj yky ; k gjk }kjk jæ k tk l drk gÅ

1/5½ dkbZHkh l gi fjer f=Hkqt 1/2 ad½ ea l eku jæ u Hkjk gÅ

1/4½ , d yMeh dsiki 3 ykbcjh dkmZgsftl l sog 3 fdrkcs i <usdsfy, ys tk l drh gS; fn ml ds: fp fd 7 fdrkcs ykbcjh ea gSftl sog i <uk pkgrh gÅ xf.kr II dh fdrkc og rHkh yrh gStcfd xf.kr I dh fdrkc Hkh ysftl l sog xf.kr II Hkh i <+ l dsrc crkb, afdrusrjhdsl sog fdrkcka dk p; u dj l drh gÅ

1/5½ ; fn A l sB rd tkusdsfy, pkj jkLrsgsvksj B l sC rd tkusds nks jkLrsgsvksj fdl h 0; fDr dks A l sC rd B l sgkdj tkuk gksrkscrkb, og fdrusrjhdka l sA l sC rd tk l drk gÅ

1/6½ Øep; o l p; dh , d gh mnkgj .k }kjk l e>kbZ Å

1/7½ fdl h l æFkk ea puko }kjk 2 vknfe; ka o 1 efgyk dks puko Fkk ; fn l æFkk ea dgy 10 vkneh o 5 efgyk, agSrkscrkb, s puko ds fdrusrjhdsgks l drs gÅ

1/8½ vaxsthd snl ----- ea l s5 letters ydj vki fdrus' kCn cuk l drsgS vc ; fn mu 5 vlrjkads' kCnkaeafdl h Hkh letter dk 2 ckj mi ; ksx fd; s tkusdh NW/ gksrksfdrus 'kCnks dk fueZk fd; k tkuk l Hkø gksckA

1/9½ vyx & vyx jæ fd cfÜk; ka l svyx & vyx l drs fn; s tkrsgÅ o nks vksj vf/kd cfÜk; ka }kjk vyx & vyx l drs fn; s tkrsgSrkscrkb; sfd bu 6 cfÜk; ka }kjk dgy

fdrus l drka dk i f k . k fd ; k tk l drk gA ¼ dr yky gjk o gjk yky nks vxy  
l dr if Jr djrs g%

¼10½ , d FkSysea5 dkyh o 6 yky xns gA fdrusrjhds l sml FkSysea l s2 dkyh o 3 yky  
xñ fudkyh tk l drh gA

¼11½ 1900 l scMh fdruh l [ ; k , a vki 8] 5] 2] 1] 9 vðks l scuk l drsgA

¼12½ , d l eñ ea5 yMfd ; k vñ 3 yMds gA fdrusrjhds l svki 5 ykxkadksbueal s NkV  
l drsgks tcf d ml l eñ ea

¼1½ , d Hkh yMdh uk gks

¼2½ de l s de 1 yMdk 1 yMdh l eñ ea gks

¼3½ de l s de 3 yMfd ; k l eñ ea vk ; s gh ughA

## y?kq mYkjh; izu

¼1½ ; fn vkj xM vkj [ k ij fclnq p Jfe . k l [ ; k  $z = x + ey$  dksfu: fi r djrk gSrks p dk  
fclnq i Fk Kkr dja tcf d dks kkd  $(z) = 0$

¼2½ ; fn  $\arg z < 0$  gks rks fl ) dja fd &  $\arg(-z) - \arg z = y$

¼3½ ; fn nks  $z_1, z_2$  vell; l fEeJ l [ ; k , i bl iðkj gSfd  $|z_1 + z_2| = |z_1| + |z_2|$  rks fl )  
dja fd &  $\arg z_1 - \arg z_2$

¼4½  $a^2 - 1 + 2ai$  dk oxñy Kkr dja

¼5½ l fEeJ l [ ; k  $z = x + iy$  dk fclnq i Fk Kkr dja ; fn  $|2 - (3 - 4i)| = 7$

¼6½  $(1 + i)(1 + 2i)(1 + 3i)$  dk eki kd Kkr dja

¼7½ l fEeJ l [ ; k  $2 - 3i$  dk ml ds l a ðeh l s ; ks xQy rFkk xqkuQy Kkr dja

¼8½  $(1 + i)$  dk xqku ifryk Kkr dja

¼9½  $(2 - iy) = 2i(1 - 3i)$  ea x vñ y dk eku Kkr dja

¼10½ & 27 dk ?kueny Kkr dja

¼11½ 18 dk prñkñy Kkr dja

¼12½  $1, w, w^2$  ; fn bdkbz ds ?kueny gSrks l ehdj . k  $(x - 1)^3 - 8 = 0$  dseny Kkr dja

- 1/3 1/2 ; fn  $|z|=1$  rks fl ) djsfd  $\frac{1+2}{1+2}=2$
- 1/4 1/2 ; fn  $\infty$  vks  $\beta$  bdkbz ds nks I fEeJ eny gSrks fl ) djsfd  $\infty^4 + \beta^4 + \infty^{-1} \beta^{-1} = 0$
- 1/5 1/2 nks jkf' k; ks dk I ekUrj ek/; 12 gSrFkk gjkRed ek/; 9 gA rks nksuka jkf' k; ka dks Kkr djA
- 1/6 1/2 ; fn  $a, b, c$  I ekUrj Js kh eagsvks  $b, c, d$  gjkRed Js kh eagSrks fl ) djsfd  $ad = bc$
- 1/7 1/2 ; fn  $a, b, c$  gjkRed Js kh eagks rks fl ) djsfd  $a(b+c), b(c+a), c(a+b)$  I ekUrj Js kh eagkA
- 1/8 1/2 gjkRed Js kh  $1, \frac{1}{3}, \frac{1}{5}, \frac{1}{7}, \dots$  ds  $n$  i nks dk ; ksQy Kkr djA
- 1/9 1/2 ; fn  $a^x = b^y = c^z$  vks  $a, b, c$  xqkkkjk Js kh eagks rks fl ) djsfd  $x, y, z$  gjkRed Js kh eagkskA
- 1/20 1/2 nks jkf' k; ka dk I ekUrj ek/; rFkk xqkkkjk ek/; 15 gSrks nksuka jkf' k; ka dks Kkr djA
- 1/21 1/2 nks jkf' k; ka dk I ekUrj ek/; 27 rFkk gjkRed ek/; 12 gSrks xqkkkjk ek/; Kkr djA
- 1/22 1/2 ; fn  $a, b, c, d$  gjkRed Js kh eagks rks fl ) djsfd  $ac + bd > b^2 + c^2$
- 1/23 1/2 gy djs ; fn  $xy = 10$  ]  $yz = 5$  ]  $zx = 2$
- 1/24 1/2 fuEu I ehdj .k dks gy djs &  
 $x + y = 7$  ]  $y + z = 9$  ]  $z + x = 10$
- 1/25 1/2  $12_{\beta}$  dk eku Kkr djA
- 1/26 1/2 0]1]2]3]4 I si kp vdk dh fdruh I  $\{ ; k, j$  cu I drh gStcfd I  $\{ ; k$  ea dkbz Hkh vad , d ckj I svf/kd u vk; A
- 1/27 1/2 7 fe= , d xky est dspjks rjQ fdrus idkj I scBk; s tk I drsgA
- 1/28 1/2  $6_{c_2}$  dk eku Kkr djA
- 1/29 1/2 , d "kVHkt ds 'kh'kkz dks feykus okys fod .kkz dh I  $\{ ; k$  Kkr djA
- 1/30 1/2 eS vi us 8 fe=ka dks fdrus idkj I spk; ikVhZ ea vkef=r dj I drk gA
- 1/31 1/2 fofHku vadks I sfdruh 9 vadh; I  $\{ ; k, a$  cu I drh gA
- 1/32 1/2 f}i n~fl ) krZ ds iz ksx ; s  $(99)^4$  dk eku Kkr djA

133½  $\frac{(1+x)^2}{1-2x}$  dsifl kj ea  $x^3$  dk xqkkad Kkr djA

134½  $(x + \frac{1}{2x})^{10}$  dsfoLrkj ea vlr l s5 okain Kkr djA

135½  $(x + \frac{1}{x})^8$  dsfoLrkj ea e/; in Kkr djA

136½ xf.krh; vkxeu dsfl ) klr l sfuEu dFku dh l R; iu dh tkr djs&

$$1+2+3+\dots+n=n^2-n \in N$$

137½ xf.krh; vkxeu fl ) klr l sfl ) dhft; sfd  $n$  ds l Hkh /ku i wkkad ekuks ds fy,  $(n+1)$  , d l e l d ; k gA

138½  $(x^2 + \frac{1}{x})^9$  dsfoLrkj ea vpj eku in Kkr djA

139½  $2^0C_1 + 2^0C_2 + 2^0C_3 + \dots + 2^0C_{20}$  dk eku Kkr djA

140½  $(1+x)^{1/2}$  dk id kj rhu in rd djA

141½  $\sum_{n=1}^{\infty} \frac{1}{(n+2)}$  dk eku Kkr djA

142½ fl ) djsfd &  $1 - \frac{1}{2} + \frac{1}{4 \cdot 2} - \frac{1}{8 \cdot 3} + \dots \infty = \frac{1}{\sqrt{e}}$

143½ fl ) djsfd &  $\log_e x = (x+1) - \frac{(x-1)^2}{2} + \frac{(x-1)^3}{3} - \frac{(x-1)^4}{4} + \dots \infty$

144½  $(e^x - 1)^2$  dsifl kj ea  $x^4$  dk xqkkad Kkr djA

145½ fl ) djsfd &  $\frac{1}{1 \cdot 2} + \frac{1}{2 \cdot 3} + \frac{1}{3 \cdot 4} + \dots \infty = \log_e 2$

146½ fl ) djsfd &  $\vec{a} + \vec{o} = \vec{o} + \vec{a}$

147½ ; fn fcUnq  $(5, n)$  rFkk fLFkfr l fn;  $\vec{a}$  gks rFkk  $|a|=13$  rks  $n$  dk eku Kkr djA

148½ l fn'k  $3\hat{i} + 3\hat{j} + \hat{k}$  rFkk  $-2\hat{i} + \hat{j} + 2\hat{k}$  ds; ksx ds l ekukUrj bdkbZ l fn'k Kkr dhft; A

149½ l fn'k fof/k l sfl ) djsfd l ekukUrj prkqt dsfod.kZ , d nll js dks l ef}Hkkftr djrsgA

## nht?kz mÙkj; i?u

¼1½  $-1-i$  dks eki kád , oa dks kád Kkr djA

¼2½ ; fn  $a^2 + b^2 = 1$  gks fl ) djafd  $\frac{1+b+ia}{1+b-ia} = beia$

¼3½  $1+i\sqrt{a^2-1}$  dk oxéy Kkr djA

¼4½  $\sqrt{-1-\sqrt{-1-\sqrt{-1}}}\dots\dots\dots\infty = \omega$  vks  $\omega^2$  fl ) djA

¼5½ fl ) djafd &  $(1+w)(1+w^2)(1+w^4)(1+w^8)\dots\dots\dots 2n$  xqku [k&/ka rd  $\frac{3}{4} 1$

¼6½ ; fn  $Z = (\lambda+3) + i\sqrt{5-\lambda^2}$  gks rks fl ) djafd  $Z$  dk fcUnq iFk , d or gkskA

¼7½ ; fn  $z_1, z_2, z_3$  l fEeJ l d ;  $k, i$  bl idkj gS fd  $|z_1| = |z_2| = |z_3| = \left| \frac{1}{z_1} + \frac{1}{z_2} + \frac{1}{z_3} \right| = 1$  rks  
fl ) djafd  $|z_1 + z_2 + z_3| = 1$

¼8½ ; fn fdl h gjkRed Jskh dk  $m$  oka in  $n$  vks  $n$  oka in  $m$  gks rks fl ) djs fd  
 $(m+n)$  oka in  $\frac{mn}{m+n}$  gkskA

¼9½  $a$  vks  $b$  nks jkf'k ; ka ds l ekulrj vks gjkRed ek/ ; ksea  $m:n$  dk vuq kr gS rks fl )  
djs fd  $\frac{a}{b} = \frac{\sqrt{m} + \sqrt{m-n}}{\sqrt{m} - \sqrt{m-n}}$

¼10½ fdl h xqkkRrj Jskh dk iFke in  $a, n$  oka in  $l$  rFkk iFke  $n$  inka dk xqkuQy  $P$  gks  
rks fl ) djs fd  $P^2 = (al)^n$

¼11½ ; fn  $3 + 3\alpha + 3\alpha^2 + \dots\dots\dots\infty = \frac{45}{8}$ ,  $\alpha > 0$  rc  $\alpha$  dk eku Kkr djA

¼12½ fuEu Jskh dk  $n$  inka dk ; kxQy Kkr djs  $0.7 + 0.77 + 0.777 + \dots\dots\dots$

¼13½ ; fn  $a, b, c$  l ekulrj Jskh ea gS rFkk  $a, mb, c$  xqkkRrj Jskh ea gS rks fl ) djs fd  
 $a, m^2b, c$  gjkRed Jskh ea gkskA

¼14½ fuEu Jskh dk ; kxQy Kkr djs  $1 + 2x + 3x^2 + 4x^3 + \dots\dots\dots\infty, (x < 1)$



145½ ; fn  $a, b, c$  l - Js eags rFkk  $x, y, z$  xq Js eags fl ) djsfd  $x^{b-c}, y^{c-a}, z^{a-b} = 1$

146½ l ehdj. kka dks gy djs  $x + y = 3, y + z = 4, z + x = 5$  , oa  $m$  dk eku Kkr djs tgka  $x + my + z = 20$

147½ ; fn  $x = cy + bz, y = az + cx, z = bx + ay$  rks fl ) djsfd  $\frac{x^2}{(1-a^2)} = \frac{y^2}{(1-b^2)} = \frac{z^2}{(1-c^2)}$  tgka  $x, y, z$  l ehdj. k 'k'; ugh gA

148½ ; fn  ${}^{2n-1}P_n : {}^{2n+1}P_{n-1} = 5 : 3$  rks  $n$  dk eku Kkr djA

149½ fl ) djsfd &  ${}^nC_r + {}^nC_{r+1} = {}^{n+1}C_r$

150½ ; fn  ${}^nP_r = {}^nP_{r+1}$  rFkk  ${}^nC_r = {}^nC_{r-1}$  rks  $n$  vksj  $r$  dk eku Kkr djA

151½ fl ) djsfd  $\left(x - \frac{1}{x}\right)^{2n}$  ds foLrkj ea e/; in dk eku  $(-1)^n \frac{1.3.5 \dots (2n-1)}{n} 2^n$  gA

152½ xf.krh; vkxeu fl ) Kkr l s fl ) djsfd  $n$  ds l Hkh /ku i wkkad ekus ds fy,  $2 + 2^2 + 2^3 + \dots + 2^n = 2(2^n - 1)$

153½ ; fn  $(1 + \lambda)^n$  ds i l kj ea fo"ke inka dk ; kxQy  $A$  vksj l e inks dk ; kxQy  $B$  gks rks fl ) djsfd  $A^2 - B^2 = (1 - \lambda^2)^n$

154½ fl ) djsfd  $e$  dk eku 2 vksj 3 dse/; gksrk gA

155½ fl ) djsfd &  $\left(\frac{a-b}{a}\right) + \frac{1}{2}\left(\frac{a-b}{a}\right)^2 + \frac{1}{3}\left(\frac{a-b}{a}\right)^3 + \dots \infty = \log_e a - \log_e b$

156½ ; fn  $\cos \alpha, \cos \beta$  vksj  $\cos \gamma$  fdl h js[kk dh fndekst ; k, a gks rks  $\cos^2 \alpha + \cos^2 \beta + \cos^2 \gamma = 1$  fl ) djA

157½ mu nks js[kk vkad schp dk dks k Kkr djsftudh fndekst ; k, a  $\begin{matrix} l + m + n = 0 \\ l^2 + m^2 + n^2 = 0 \end{matrix}$  nh xbl gA

158½ fl ) djafd  $\sqrt{a+ib} + \sqrt{a-ib} = \sqrt{2[\sqrt{a^2+b^2} + a]}$

159½ ; fn  $\frac{a+ib}{c+id} = x+iy$  gks rks fl ) djsfd  $\frac{a-ib}{c-id} = x-iy$  rFkk  $x^2 + y^2 = \frac{a^2+b^2}{c^2+d^2}$

130½ ; fn  $a, b, c$  gjkRed Js kh ds  $p$  os  $q$  vks  $\alpha$  os in gks rks fl ) djs fd  
 $bc(q-r) + ca(r-q) + ab(p-q) = 0$

131½ gjkRed Js kh dh 3 I  $\alpha$ ; kvka dk ; kx 11 gsmuds 0;  $\alpha$  dk ; kx 1 gS 1 I  $\alpha$ ; k Kkr  
 djA

132½ ; fn  $x = 1 + a + a^2 + \dots \infty (|a| < 1)$ ,  $y = 1 + b + b^2 + \dots \infty (|b| < 1)$  rks fl ) djs fd  
 $1 + ab + a^2b^2 + \dots \infty = \frac{xy}{x+y-1}$

133½ nks I  $\alpha$ ; kvka ds chp nks I ekulrj ek/;  $A_1, A_2$  nks xq kkskj ek/;  $C_1, C_2$  vks gjkRed eku  
 $H_1$  vks  $H_2$  gS rks fl ) djs fd  $\frac{A_1 + A_2}{H_1 + H_2} = \frac{C_1 + C_2}{H_1 + H_2}$

## bdkbZ & 2

### f=dks kferh;

vfr y?kqñkj; izu

141½ fl ) dhft, &  $(\sin \theta - \cos \theta)^2 = 1 - \sin 2\theta$

142½ ; fn  $\tan \theta = \frac{a}{b}$  gks rks  $\cos \theta$  dk eku Kkr dhft; A

143½  $\sin(bx + 2\pi)$  dk eku fdruk gsrk gA

144½  $\cos 330^\circ$  dk eku Kkr dhft; A

145½  $\sin(A+B)$ ,  $\sin(A-B)$  dk eku  $\cos A$ ,  $\cos B$  ds inks ea fyf[k; A

146½  $\sin 75^\circ$  dk eku Kkr dhft; A

147½  $\sin^2 A$  dk eku  $\tan A$  ds inks ea inks ea fyf[k, A

148½  $\sin 3x$  dk vkorZky Kkr dhft; A

149½  $\sin \theta = \frac{1}{2}$  dk 0; k; d gy fyf[k; A

10½ usi ; j dh vuq irk fyf[k; A

11½ , d f=Hkqt ds rhuka dks k l ekUrj Js kh eagS; fn l cl scMk dkak 90° dk gks rks l cl s Nks/k dks k Kkr dhft; A

12½ ; fn fdl h f=Hkqt ea  $\angle a = 45^\circ$  rFkk  $\angle b = 90^\circ$  gks rks  $a:b$  Kkr dhft; A

13½ ; fn  $a=8, b=7, c=5$  gks rks dks k  $B$  dk eku Kkr dhft; A

14½ i zki l = D; k gsfyf[k; A

15½ ; fn fdl h m/oZkj n.M dh ijgkbl ml dh yeckbl dh  $\angle B$  xqih gks rks l wZ dk mlu; u dkak Kkr dhft; A

### y?kqYkjh; iZu

1½ ; fn  $x = y \cos \frac{2\pi}{3} = z = \cos \frac{4\pi}{3}$  gks rks fl ) fdft; sfd  $xy + yz + zx = 0$

2½ fl ) fdft; s &  $\cos(a+b) \cos(a-b) = \cos^2 a - \sin^2 b - \sin^2 a$

3½ ; fn  $A+B = \frac{\pi}{4}$  gks rks fl ) fdft; sfd &  $(\tan A - 1)(\cot B - 1) = 2$

4½ fl ) fdft; sfd &  $\tan\left(\frac{\pi}{4} + \theta\right) - \tan\left(\frac{\pi}{4} + 0\right)\theta = 2 \tan 2\theta$

5½ ; fn  $A+B+C = \pi$  gks rks fl ) fdft; sfd &  $\sin 2A + \sin 2B - \sin 2C = 4 \cos A \cos B \sin C$

6½  $y = 2 \sin x$  dk js[kk fp= f[kk; s tcf d  $0 \leq x \leq 2\pi$

7½ l ehdj.k  $\sin^2 \theta - 2 \cos \theta + \frac{1}{4} = 0$  dk 0; ki d gy Kkr dhft; A

8½ l ehdj.k gy dhft; s &  $\cot 4\theta - \cot \theta = 0$

9½ ; fn fdl h f=Hkqt  $ABC$  ea  $\angle a = 75^\circ, \angle b = 30^\circ, b = \sqrt{8}$  gks rks Hkqt k  $a$  Kkr fdft; A

10½ fdl h f=Hkqt  $ABC$  ea fl ) dhft; sfd &  $\cos \frac{A}{2} = \sqrt{\frac{s(s-a)}{bc}}$

11½ ; fn  $\triangle ABC$  ea  $a=3, b=4$ , rFkk  $c=5$  gks rks  $\cos A$  dk eku Kkr dhft; A

12½ fl ) dhft; sfd &  $1 - \tan \frac{A}{2}, \tan \frac{B}{2} = \frac{2c}{a+b+c}$

13½ ; fn  $a, b, c$  l ekUrj J.kh eagks rks fl ) dhft; sfd &  $\cot \frac{A}{2} \cdot \cot \frac{C}{2} = 3$

14½ f=Hkqt  $ABC$  eafl ) dhft; sfd &  $\sin A + \sin B + \sin C = \frac{S}{R}$

15½ I h/kh {kfr y I Mē I sm/okZkj fLFkr gokbz tgkt I sl Mē dsnks Øekxr i RFkjka dsk tks gokbz tgkt dsnks ukavkj fLFkr gsvoueu dsk  $\infty$  vkj  $B$  gA fl ) dhft; sfd I Mē

I sgokbz tgkt dh Åpkbz  $\frac{\tan A, \tan B}{\tan A + \tan B}$  gA

1/2 1/2

**f=dkskfefr**

1/4 1/2  $\frac{\sin a}{1 + \cos a} + \frac{1 + \cos a}{\sin a} =$

- (a)  $2 \sin a$  (b)  $2 \cos a$  (c)  $2 \cos es$  (d)  $2 \text{tena}$

1/2 1/2 ; fn  $x = r \sin \theta \cos \theta$   $y = r \sin \theta \sin \theta$  rFkk  $yz = r \cos \theta$  gArks

$x^2 + y^2 + z^2 =$

- (a)  $r^2$  (b)  $r^3$  (c)  $2r$  (d)  $2r^2$

1/3 1/2  $\frac{1}{1 + \tan \theta} + \frac{1}{1 + \cot \theta} =$

- (a) 1 (b) -1 (c) 2 (d) -2

1/4 1/2  $\frac{\tan \theta}{\sec \theta + 1} + \frac{\sec \theta}{\tan \theta} =$

- (a)  $2 \sin \theta$  (b)  $2 \cos \theta$  (c)  $2 \cos es \theta$  (d)  $2 \tan \theta$

1/5 1/2 ; fn  $\sin \theta + \sin^2 \theta = 1$  gsrks  $\cos^2 \theta + \cot^4 =$

- (a) 1 (b) -1 (c) 2 (d) 0

1/6 1/2 ; fn  $\cos \theta = \frac{4}{5}$  gsrks  $\tan \theta + \sec \theta =$

- (a) 1 (b) -1 (c) 2 (d) -2

1/7 1/2 ; fn  $\tan \theta = \frac{5}{12}$  gks rks  $\frac{2 \cos \theta - 3 \sin \theta}{2 \cos \theta + 3 \sin \theta} =$

- (a)  $\frac{1}{13}$  (b)  $\frac{2}{13}$  (c)  $\frac{3}{13}$  (d)  $\frac{5}{13}$

1/8 1/2  $\sin \frac{\pi}{3} \cdot \tan \frac{\pi}{6} \cdot \cos \frac{\pi}{4} =$

- (a)  $\frac{1}{\sqrt{2}}$  (b)  $\frac{1}{2\sqrt{2}}$  (c)  $\frac{1}{3\sqrt{2}}$  (d)  $\frac{\sqrt{3}}{2}$

$$10\frac{1}{2} \quad \sin^2 \frac{\pi}{6} + \sin^2 \frac{\pi}{4} + \sin^2 \frac{\pi}{3} =$$

- (a)  $\frac{1}{2}$ ] (b)  $\frac{3}{2}$ ] (c)  $\frac{5}{2}$ ] (d)  $\frac{7}{2}$

$$11\frac{1}{2} \quad \tan 330^\circ =$$

- (a)  $\frac{1}{\sqrt{2}}$ ] (b)  $-\frac{1}{\sqrt{2}}$ ] (c)  $\frac{1}{\sqrt{3}}$ ] (d)  $-\frac{1}{\sqrt{3}}$

$$12\frac{1}{2} \quad \sum_{n=1}^{360^\circ} \sin x^\circ =$$

- (a) 0 ] (b) 1] (c) &1] (d) 2

$$13\frac{1}{2} \quad \frac{\tan(90^\circ + \theta) \cdot \operatorname{cosec}(180^\circ + \theta)}{\cos(180^\circ + \theta) \cdot \operatorname{cosec}(-\theta)} =$$

- (a) 1] (b) &1] (c) 2] (d) &2

$$14\frac{1}{2} \quad 4 \cot^2 \frac{\pi}{4} - \sec^2 \frac{\pi}{3} + \sin^2 \frac{\pi}{6} =$$

- (a)  $\frac{1}{2}$ ] (b)  $\frac{1}{4}$ ] (c)  $\frac{1}{6}$ ] (d)  $\frac{1}{8}$

$$15\frac{1}{2} \quad \tan^2 \frac{\pi}{6} - \tan^2 \frac{\pi}{4} + \tan^2 \frac{\pi}{3} =$$

- (a)  $\frac{7}{3}$ ] (b)  $\frac{10}{3}$ ] (c)  $\frac{13}{3}$ ] (d)  $\frac{17}{3}$

$$16\frac{1}{2} \quad \frac{\cos 11^\circ + \sin 11^\circ}{\cos 11^\circ - \sin 11^\circ} =$$

- (a)  $\tan 11^\circ$ ] (b)  $\sin 11^\circ$ ] (c)  $\cos 11^\circ$ ] (d)  $\tan 56^\circ$

$$17\frac{1}{2} \quad \frac{\cos 17^\circ - \sin 17^\circ}{\cos 17^\circ + \sin 17^\circ} =$$

- (a)  $\tan 62^\circ$ ] (b)  $\tan 28^\circ$ ] (c)  $\tan 17^\circ$ ] (d)  $\cos 17^\circ$

17½  $\sin\left(\frac{\pi}{4} + x\right) - \sin\left(\frac{\pi}{4} - x\right) =$

- (a)  $\sqrt{2} \sin x$  (b)  $\sqrt{2} \cos x$  (c)  $\sqrt{2} \tan x$  (d)  $\sqrt{2} \cot x$

18½  $\sin^2 75^\circ - \sin^2 15^\circ =$

- (a)  $\frac{1}{2}$  (b)  $\frac{\sqrt{3}}{2}$  (c)  $\frac{1}{\sqrt{3}}$  (d)  $\frac{2}{\sqrt{3}}$

19½  $\frac{1 - \tan 11^\circ}{1 + \tan 11^\circ} =$

- (a)  $\tan 11^\circ$  (b)  $\tan 45^\circ$  (c)  $\tan 56^\circ$  (d)  $\tan 34^\circ$

20½ ; jika  $\tan A = \frac{1}{2}$  dan  $\tan B = \frac{1}{3}$  maka  $\tan A + B =$

- (a)  $\frac{\pi}{2}$  (b)  $\frac{\pi}{3}$  (c)  $\frac{\pi}{4}$  (d)  $\frac{\pi}{6}$

21½ ; jika  $\tan A = \frac{n}{n+1}$  dan  $\tan B = \frac{n}{2n+1}$  maka  $\tan A + B =$

- (a) 1 (b)  $\frac{1}{2}$  (c) 2 (d) 0

22½ ; jika  $\tan A + B = \frac{\pi}{4}$  maka  $(1 + \tan A)(1 + \tan B) =$

- (a) 1 (b)  $\frac{1}{2}$  (c) 2 (d) 0

23½  $\sin 20^\circ \sin 40^\circ \sin 60^\circ \sin 80^\circ =$

- (a)  $\frac{1}{16}$  (b)  $\frac{3}{16}$  (c)  $\frac{5}{16}$  (d)  $\frac{9}{16}$

124½  $\cos 20^\circ \cos 40^\circ \cos 60^\circ \cos 80^\circ =$

- (a)  $\frac{1}{16}$ ] (b)  $\frac{3}{16}$ ] (c)  $\frac{5}{16}$ ] (d)  $\frac{9}{16}$

125½  $\frac{\sin 2\theta + \sin 2B}{\cos 2A + \cos 2B} =$

- (a)  $\sin(A+B)$ ] (b)  $\cos(A+B)$ ] (c)  $\tan(A+B)$ ] (d)  $\cot(A+B)$

126½  $\frac{\sin \theta + \sin 2\theta}{1 + \cos \theta + \cos 2\theta} =$

- (a)  $\sin \theta$ ] (b)  $\cos \theta$ ] (c)  $\tan \theta$ ] (d)  $\sec \theta$

127½  $\frac{1 + \sin \theta - \cos \theta}{1 + \sin \theta + \cos \theta} =$

- (a)  $\sin \frac{\theta}{2}$ ] (b)  $\cos \frac{\theta}{2}$ ] (c)  $\tan \frac{\theta}{2}$ ] (d)  $\cot \frac{\theta}{2}$

128½  $\frac{1 + \tan^2(45 - A)}{1 - \tan^2(45 - A)} =$

- (a)  $\sin 2A$ ] (b)  $\cos 2A$ ] (c)  $\tan 2A$ ] (d)  $\cot 2A$

129½  $\sqrt{2 + \sqrt{2 + 2 \cos 4\theta}} =$

- (a)  $2 \sin \theta$ ] (b)  $2 \cos \theta$ ] (c)  $2 \tan \theta$ ] (d)  $2 \sec \theta$

130½ If  $\sin \theta = \frac{\sqrt{3}}{2}$  then

- (a)  $\theta = n\pi + (-1)^n \frac{\pi}{3}$ ] (b)  $\theta = n\pi + (-1)^n \frac{\pi}{6}$   
 (c)  $\theta = n\pi + (-1)^n \frac{\pi}{6}$ ] (d)  $\theta = 2n\pi \pm \frac{\pi}{3}$



131½ ; fn l ehdj .k  $3 \tan^2 = 1$  gsrks 0; ki d gy&

(a)  $\theta = n\pi + \frac{\pi}{6}$  ]      (b)  $\theta = n\pi + \frac{\pi}{3}$  ]

(c)  $\theta = n\pi \pm \frac{\pi}{3}$  ]      (d)  $\theta = n\pi \pm \frac{\pi}{6}$

132½ ; fn l ehdj .k  $\cos 2\theta = \cos^2 \theta$  gsrks 0; ki d gy &

(a)  $\theta = n\pi$  ]    (b)  $\theta = 2n\pi$  ]    (c)  $\theta = 3n\pi$     (d)  $\theta = 4n\pi$

133½ l eh  $\frac{1 - \cos 2\theta}{1 + \cos 2\theta} = 3$  gsrks 0; ki d gy&

(a)  $\theta = n\pi + \frac{\pi}{3}$  ]    (b)  $\theta = n\pi + \frac{\pi}{6}$  ]    (c)  $\theta = n\pi \pm \frac{\pi}{3}$  ]    (d)  $\theta = n\pi \pm \frac{\pi}{6}$

134½ l ehdj .k  $\tan \theta + \tan 2\theta + \sqrt{3} \tan \theta \cdot \tan 2\theta = 2\sqrt{3}$  dk 0; ki d gy&

(a)  $\theta = \frac{n\pi}{3} + \frac{\pi}{9}$  ]    (b)  $\theta = \frac{n\pi}{3} - \frac{\pi}{9}$  ]    (c)  $\theta = \frac{n\pi}{6} + \frac{\pi}{3}$  ]    (d) buel s dkkb/ ugh

135½ ; fn  $\angle A = 30^\circ$  ]  $\angle B = 60^\circ$  gsrks  $a : b : c =$

(a)  $\sqrt{3} : 1 : 2$     (b)  $1 : 2 : \sqrt{3}$     (c)  $1 : \sqrt{3} : 2$

bdkbz 1/4 o 2 1/2 **XI**

oLrfu" B i / u

1/1 1/2 ; fn  $(x+y)(3+2i)=1+i$  gks rks  $x$  rFkk  $y$  dk eku gksk &

- (a)  $x=4, y=9$       (a)  $x=26, y=0$       (a)  $x=0, y=26,$       (a)  $x=9, y=6$

1/2 1/2  $(1+i)^2$  dk l a keh gksk &

- (a)  $1-i,$       (a)  $2i,$       (a)  $2(1-i),$       (a)  $-2i$

1/3 1/2  $(3+\omega+3\omega^2)^4 =$

- (a)  $16]$       (a)  $16\omega]$       (a)  $16\omega^2]$       (a) bl ea l s dkbz ugha

1/4 1/2  $(3+4i)$  dk oxehy gksk &

- (a)  $\sqrt{3}+i]$       (a)  $2-i]$       (a)  $2+i]$       (a)  $3-4i$

1/5 1/2 ; fn  $z = \frac{1+2i}{1-2i}$  gsrks  $Arg(z) =$

- (a)  $0,$       (a)  $\pi/3]$       (a)  $\pi/4]$       (a)  $\pi/2$

1/6 1/2 ; fn  $(\cos\theta - i/\sin\theta)^2 = x-iy$  rks  $x^2 + y^2 =$

- (a)  $0,$       (a)  $1]$       (a)  $2]$       (a)  $3-$

1/7 1/2  $(-1-i)$  dk ekid gksk &

- (a)  $\sqrt{2}]$       (a)  $-\sqrt{2},$       (a)  $\sqrt{3},$       (a)  $-\sqrt{3},$

1/8 1/2 8 ds?kueny  $2]$   $2\omega]$   $2\omega^2$  gksk &

- (a)  $AP,$       (a)  $GP,$       (a)  $HP,$       (a) bu ea l s dkbz ugha

1/9 1/2  $(1-\omega)(1-\omega^2)(1-\omega^4)(1-\omega^8) =$

- (a)  $6]$       (a)  $9]$       (a)  $18]$       (a)  $27-$

1/10 1/2  $(1+i)(1+2i)(1+3i)$  dk ekid gksk &

- (a)  $10]$       (a)  $11]$       (a)  $6]$       (a)  $15$

11½ ; fn  $z_1, z_2$  nks v'kk; I fEeJ I  $\arg(z_1 + z_2) = |z_1 - z_2|$  rks  
 $\text{Arg}Z_1 - \text{Arg}Z_2 =$

- (a)  $\frac{\pi}{6}$ , (a)  $\frac{\pi}{2}$ , (a)  $\frac{\pi}{3}$ , (a)  $\frac{\pi}{4}$ ,

12½ ; fn  $(1+i)(1+2i)(1+3i)\dots\dots\dots(1+ni) = x+iy$  gks rks  
 $2.5.10\dots\dots(1+n^2) =$

- (a)  $x-y$ , (a)  $x+y$ , (a)  $x^2-y^2$  (a)  $x^2+y^2$

13½ ; fn I fEeJ I  $\arg(z)$   $z+iz$  rFkk  $z$  I sfu: fir fclnqka I scuus okys f=Hkqt  
 dk {k=Qy 20 gks rks  $|z| =$

- (a) 50] (a) 40] (a) 20] (a) 10

14½ ; fn  $y = x - x^2 + x^3 - x^4 \dots\dots\dots \infty$  gks rks  $x =$

- (a)  $\frac{y}{1-y}$ , (a)  $\frac{y}{1+y}$ , (a)  $\frac{y+1}{y}$ , (a)  $\frac{y-1}{y}$

15½ Js kh  $\frac{1}{4}, \frac{-1}{2}, 1, \dots\dots\dots$  dk dkS I k in & 128 gS\

- (a) 5 okain] (a) 10 okain] (a) 15 okain] (a) 20okain

16½ , d xqkkRrj Js kh dk  $p$  okain  $a$  rFkk  $q$  okain  $b$  gS rks I okZur  $r$  dk eku  
 gksk &

- (a)  $\left(\frac{a}{b}\right)^{\frac{1}{p-q}}$ , (a)  $\left(\frac{a}{b}\right)^{\frac{1}{p+q}}$ , (a)  $\left(\frac{b}{a}\right)^{\frac{1}{p-q}}$ , (a)  $\left(\frac{b}{a}\right)^{\frac{1}{p+q}}$

17½ Js kh  $\frac{2}{27}, \frac{2}{9}, \frac{2}{9} \dots\dots\dots 162$  dk var I srhl jk in gksk &

- (a) 8] (a) 18] (a) 28] (a) 38-

18½ k dsfdl eku dsfy, I  $\arg(z)$   $(1+k)\left(\frac{5}{6}+k\right)$  vks  $\left(\frac{13}{18}+k\right)$  xqkkRrj Js kh ea  
 gksk &

- (a)  $\frac{1}{2}$ , (a)  $\frac{-1}{2}$ , (a)  $\frac{1}{4}$ , (a)  $\frac{5}{6}$

19½ Jskh  $9^{\frac{1}{3}} \cdot 9^{\frac{1}{9}} \cdot 9^{\frac{1}{27}} \dots \dots \dots \infty =$

- (a) 3]            (a)  $\frac{1}{3}$             (a) 9]            (a)  $\frac{1}{9}$

20½ ; fn  $1+11+111+\dots \dots \dots n$  inka rd ; kx  $= \frac{10}{81}(10^n - 1) + k$

rks k dk eku &

- (a)  $\frac{n}{9}$     (a)  $\frac{-n}{9}$     (a)  $\frac{n}{81}$     (a)  $\frac{-n}{81}$

21½ ; fn  $a$  vks  $b$  ds chp xqkkRrj e/;  $\frac{a^{n+1} + b^{n+1}}{a^n + b^n}$  gS rks dk eku

- (a)  $\frac{1}{3}$     (a)  $\frac{-1}{3}$     (a)  $\frac{1}{2}$     (a)  $\frac{-1}{2}$

22½ nks jkf'k; ks dk l ekrj ek/;  $\frac{13}{2}$  rFkk gjkRed ek/;  $\frac{72}{13}$  gA rks mudk xqkkRrj ek/

; gksk

- (a) 36    (a) 72    (a) 6    (a) 13

23½ i Fke  $n$  i kdr l d; kvka da?kuks dk ; kxQy

- (a)  $\frac{n}{2}(n+1)$     (a)  $\frac{n}{2}(n+1)(2n+1)$     (a)  $\left[\frac{n}{2}(n+1)\right]^2$     (a)  $\frac{n}{2}^{(n+2)}$

24½  $1^3 - 2^3 + 3^3 - 4^3 + \dots \dots \dots + 9^3$  dk eku

- (a) 225 325    (a) 425    (a) 625

25½ ; fn  $3+5r+7r^2+\dots \dots \dots 00 = \frac{44}{9}$  gS rks  $r$  dk eku

- (a)  $\frac{1}{2}$     (b)  $\frac{1}{3}$     (c)  $\frac{1}{4}$     (d)  $\frac{1}{5}$

126½  $\frac{1^3 + 2^3 + 3^3 + \dots + 12^3}{1^2 + 2^2 + 3^2 + \dots + 12^2} =$

- (a)  $\frac{134}{25}$  (b)  $\frac{234}{25}$  (c)  $\frac{334}{25}$  (d)  $\frac{434}{25}$

127½ Js kh  $4\frac{1}{2}$  3  $2\frac{1}{4}$   $1\frac{4}{5}$  dk 80kWin gksk

- (a) 1 (b) -1 (c) 2 (d) -2

128½ ; fn  $x = cy + bz$   $y = az + cx$   $z = bx + ay$  tgkllk  $y$   $z$  l Hkh 'kq; ugh gsrks

$a^2 + b^2 + c^2 + 2abc =$

- (a) 0 (b) 1 (c) 2 (d) -1

129½ l ehdj.k  $xy = 7$   $yz = 5$   $zx = 2$  gsrksy dk eku

- (a)  $\pm 1$  (b)  $\pm 2$  (c)  $\pm 3$  (d)  $\pm 5$

130½ l ehdj.k  $x + y = 7$   $y + z = 9$   $z + x = 10$  gsrksy dk eku

- (a) 3 (b) 4 (c) 5 (d) 6

131½ l ehdj.k  $\frac{1}{x} + \frac{1}{y} = 5$   $\frac{1}{y} + \frac{1}{x} = 7$  rFkk  $\frac{1}{z} + \frac{1}{x} = 6$  gsrks  $x$  dk eku

- (a)  $\frac{1}{2}$  (b)  $\frac{1}{3}$  (c)  $\frac{1}{4}$  (d)  $\frac{1}{5}$

132½ ; fn  $12_p = 1320$  gsrks  $r$  dk eku

- (a) 3 (b) 6 (c) 13 (d) 15

133½  $\lfloor -n =$

- (a) 0 (b) 1 (c) 00 (d) -1

134½  $9_{p_3} + 3 9_{p_2} =$

- (a)  $10_{p_2}$  (b)  $10_{p_3}$  (c)  $10_{p_4}$  (d)  $10_{p_5}$

135½  $n_{c_r} + 2 n_{c_{r-1}} + n_{c_{r-2}} =$

- (a)  $n + 1_{c_r}$  (b)  $n + 2_{c_r}$  (c)  $n + 3_{c_r}$  (d)  $n + 4_{c_r}$

136½ ; fn  $n_{p_r} = n_{p_{r+1}}$  rFkk  $n_{c_r} = n_{c_{r+1}}$  gks rks  $n$  dk eku

- (a) 2 (b) 3 (c) 4 (d) 5

137½ ; fn  $n_{c_{r-1}} : n_{c_r} : n_{c_{r+1}} = 3 : 4 : 5$  gks rks  $r$  dk eku

- (a) 7] (b) 17] (c) 27] (d) 62]

138½ ; fn  ${}^{10}C_r = {}^{10}C_{r+4}$  gks rks  ${}^5C_r$  dk eku

- (a) 10] (b) 20] (c) 30] (d) 40]

139½ ; fn , d cgHkqt ds 44 fod.kz gS rks ml dh Hkqt kvka dh l d ; k gksxh

- (a) 8] (b) 8] (c) 11] (d) 11]

140½  ${}^{47}C_4 - \sum_{r=1}^5 {}^{52-r}C_3 =$

- (a)  ${}^{50}C_4$ ] (b)  ${}^{51}C_4$  (c)  ${}^{52}C_4$  (d)  ${}^{52}C_3$

141½  $\left( n - \frac{1}{x} \right)^{10}$  ds id kj ea e/; in gksxk

- (a) 152] (b) 152] (c) 252] (d) 252]

142½  $(n^2 - \frac{1}{n^2})^8$  ds id kj ea Loræ in

- (a)  ${}^8C_4$ ] (b)  ${}^{10}C_4$ ] (c)  ${}^{16}C_6$ ] (d)  ${}^{16}C_8$ ]

143½ ; fn  $\left( x^2 + \frac{k}{x} \right)^5$  ds id kj ea  $rc$  dk xqkka 270 gks rks  $k$  dk eku

- (a) 3] (b) 27] (c) 9] (d) 47

144½ ; fn  $\left(x^4 - \frac{1}{x^3}\right)^{15}$  ds i tkj ea  $n-17$  dk xqkkad vkrk gsrks r dk eku &

- (a) 12] (b) 15] (c) 18] (d) 21

145½  ${}^{30}C_1 {}^{30}C_2 {}^{30}C_3 \dots {}^{30}C_{30} =$

- (a)  $2^{30}$ ] (b)  $2^{30} - 1$ ] (c)  $2^{30} + 1$ ] (d)  $2^{29}$

146½  $C_0^2 + C_1^2 + C_2^2 + \dots + C_n^2 =$

- (a)  $\frac{2n}{n}$ , (b)  $\frac{2n}{(n)^2}$  (c)  $\left(\frac{2n}{n}\right)^2$  (d)  $\frac{(2n)^2}{n}$

147½  $\frac{C_1}{2} {}^nC_3 {}^nC_5 \dots =$

- (a)  $\frac{2^n}{n+1}$  (b)  $\frac{2^n + 1}{n+1}$  (c)  $\frac{2^n - 1}{n+1}$  (d)  $\frac{2^n}{n-1}$

148½  $\frac{C_1}{C_0} {}^nC_2 {}^nC_3 \dots {}^nC_n =$

- (a)  $\frac{n}{2}$  (b)  $\frac{n+1}{2}$  (c)  $\frac{n(n+1)}{2}$  (d)  $\frac{n(n-1)}{2}$

149½  $(1+x-3x^2)^{2143}$  ds i tkj ea xqkkadka dk ; kxOy &

- (a) 2144 (b) 0 (c) 1] (d) &1

150½ ; fn  $(1+n)^{18}$  ds i tkj ea  $(2r+4)$  oa vks  $(r-2)$  oa i nka ds xqkkad cjkj gsrks r dk eku &

- (a) 4] (b) 6] (c) 8] (d) 10

151½  $(1+n)^{2n}$  ds i tkj ea  $(p+1)$  oa in dk xqkkad  $(p+3)$  oa in ds xqkkad ds cjkj gsrks &

- (a)  $p = n - 1$ ] (b)  $p = n + 1$ ] (c)  $2n = 2p + 1$ ] (d)  $2n = 2p - 1$

152½ ;fn  $(1+n)^n$  ds id kj es fo"ke inkadk ; kxQy A vks l e inkadk ; kxQy B gks rks  $(1-n^2)^n =$

- (a)  $A^2 + B^2$ ] (b)  $A^2 - B^2$ ] (c)  $A^2 B^2$ ] (d)  $A^2/B^2$

153½ e dk eku &

- (a)  $2 < e < 3$ ] (b)  $2 < e < 3$ ] (c)  $3 < e < 2$ ] (d)  $2 \leq e \leq 3$

154½  $\sum_{n=1}^{\infty} \frac{1}{n+1}$  dk ; kxQy gksk &

- (a)  $e$  (b)  $2e$  (c)  $e-2$  (d)  $e+2$

155½  $\sum_{n=1}^{\infty} \frac{n_{c_2} 3^{n-2}}{n} =$

- (a)  $\frac{e}{2}$  (b)  $\frac{e^2}{2}$  (c)  $\frac{e^3}{2}$  (d)  $\frac{e^4}{2}$

156½  $\sum_{n=1}^{\infty} \frac{n_{c_0} + n_{c_1} + n_{c_2} + n_{c_3} + \dots + n_{c_n}}{n_{p_n}} =$

- (a)  $e-1$  (b)  $e+1$  (c)  $e^2+1$  (d)  $e^2-1$

157½  $1 + \left(\frac{1}{2} + \frac{1}{3}\right)\frac{1}{4} + \left(\frac{1}{4} + \frac{1}{5}\right)\frac{1}{4^2} + \dots =$

- (a)  $\log \sqrt{2}$ ] (b)  $\log \sqrt{8}$ ] (c)  $\log \sqrt{12}$ ] (d)  $\log \sqrt{24}$

158½  $2 \left[ 1 + \frac{(\log n)^2}{2} + \frac{(\log n)^4}{4} + \frac{(\log n)^6}{6} + \dots + \infty \right] =$

- (a)  $n + \frac{1}{n}$  (b)  $n - \frac{1}{n}$  (c)  $\log n$  (d)  $\log \frac{1}{n}$

159½ Js kh  $1 + \frac{(a+bx)}{1} + \frac{(a+bx)^2}{2} + \dots + \frac{(a+bx)^n}{n} + \dots$  es  $x^n$  dk xqkka g&

- (a)  $\frac{b^n}{n}$  (b)  $\frac{a^n}{n}$  (c)  $\frac{e^a a^n}{n}$  (d)  $\frac{e^b a^n}{n}$



$$\%60\frac{1}{2} \frac{1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{6} + \dots}{1 + \frac{1}{3} + \frac{1}{5} + \frac{1}{7} + \dots} =$$

- (a)  $\frac{e-1}{e+1}$       (b)  $\frac{e+1}{e-1}$       (c)  $\frac{e^2+1}{e^2-1}$       (d)  $\frac{e^2-1}{e^2+1}$

$$\%61\frac{1}{2} \frac{1}{1} + \frac{1+3}{2} + \frac{1+3+3^2}{3} + \frac{1+3+3^2+3^3}{4} + \dots \infty =$$

- (a)  $\frac{e(e^2-1)}{2}$       (b)  $\frac{e(e^2+1)}{2}$       (c)  $\frac{e(e+1)}{2}$       (d)  $\frac{e(e-1)}{2}$

## f= dks kfefr

y?kq mYkjh; itu

- 1-  $\emptyset y = \sin x$  dsfy, xkQ [kfrp; s tc  $\theta \leq x < 2\pi$
- 2- , d ?kMh dh feuV dh I pZ 1-5 I seh- yEch g\$50 feuV pyuseabl dh ; g I pZ fdruh ?kq tk, xh \
- 3- T; kfefr I sfl ) djafd  $1 + \tan^2 \theta = \sec^2 \theta$
- 4- fl ) djafd  $\sqrt{\frac{1 + \sin \theta}{1 - \sin \theta}} = \sec \theta + \tan \theta$
- 5- ; fn  $\cos \theta + \sin \theta = \sqrt{2} \cos \theta$  gks rks fl ) djafd  
 $\cos \theta - \sin \theta = \sqrt{2} \sin \theta$
- 6- fl ) dhft, fd %&  
 $\tan 60^\circ = \frac{2 \tan 30^\circ}{1 - \tan^2 30^\circ}$
- 7- fl ) djafd  $\cos 27^\circ \tan 27^\circ \tan 63^\circ \operatorname{cosec} 63^\circ = 1$
- 8-  $\cos 75^\circ$  dk eku Kkr djs
- 9- ; fn  $A + B = \frac{\pi}{4}$  gks rks fl ) djafd  $(\cot A - 1)(\cot B - 1) = 2$
- 10- ; fn  $(\tan 140^\circ - \tan 110^\circ) = K + \tan 140^\circ \cdot \tan 110^\circ$  gks rks K dk eku Kkr djs
- 11- fl ) djsfd &  
 $2 \sin 75^\circ \cos 15^\circ = \frac{1}{2}(2 + \sqrt{3})$
- 12- fl ) djsfd &  
 $\frac{\cos 2B + \cos 2A}{\cos 2B - \cos 2A} = \cot(A + B) \cot(A - B)$
- 13- fl ) djsfd &  
 $\frac{1 + \tan^2(45^\circ - \theta)}{1 - \tan^2(45^\circ - \theta)} = \operatorname{cosec} 2\theta$
- 14- ; fn  $2 \tan + \cot \beta = \tan \alpha$  ] gks rks fl ) djafd  
 $2 \tan + \cot \beta = 2 \tan(\alpha - \beta)$
- 15-  $f(\theta) = \sqrt{3} \sin \theta - \cos \theta$  dk vkorl dky Kkr dja \
- 16-  $3 + \sin 3x$  dk vk; ke Kkr djs \

- 17- ; fn  $\cos(\alpha + \beta) = 0$  gks rks fl ) dhft , fd  $\sin(5\alpha + 6\beta) = \sin \alpha$
- 18- ; fn  $\sin \theta = \sin \alpha$  gks rks fl ) djafd  $\sin \frac{\theta}{3} = \sin \left[ \frac{n\pi}{3} + (-1)^n \frac{\pi}{3} \right]$
- 19- I ehdj.k dks gy dja &  
 $\tan^2 \theta + \cot^2 \theta = 2$
- 20- I ehdj.k gy dja &  
 $\cos m\theta = \sin n\theta$
- 21- fuEu I ehdj.k dks gy dja  
 $\cos \theta - \sqrt{3} \sin \theta = 1$
- 22- I ehdj.k  $\sin x + \cos x = 2$  ea gyks dh I ; k Kkr dja \
- 23- fdl h f=Hkqt  $ABC$  ea dks k  $B$  ] dks k  $A$  I scMk gS ; fn dks k  $A$  vks  $B$  ds eku I ehdj.k  $3 \sin x - 4 \sin^3 x - k = 0 < k < 1$  dks I rkv djrs gS rks dks k  $c$  dk eku Kkr dja
- 24- fl /n djsfd  $\tan BA - \tan 2A - \tan A = \tan 3A \cdot \tan 2A \cdot \tan A$
- 25- ; fn  $A + B + C = \pi$  gks rks fl /n dhft ; sfd  
 $\cos 2A + \cos 2B + \cos 2C = -1 - 4 \cos A \cos B \cos C$
- 26- ; fn fdl h  $\Delta ABC$  ea  $\angle A = 30^\circ, \angle C = 45^\circ$  gks rks  $a : c$  dk eku Kkr dja
- 27- fdl h f=Hkqt  $ABC$  ea ; ; fn  $c = \sqrt{3} + 1$  ]  $a = \sqrt{3} - 1$  vks  $\angle B = 60^\circ$  gks rks fl )  
 djafd  $\tan \frac{C - A}{2} = 1$
- 28- fdl h f=Hkqt  $ABC$  ea  $a = 25, b = 52, vks c = 63$ , gks rks  $\tan \frac{B}{2}$  vks  $\tan \frac{C}{2}$  dk eku Kkr dja \
- 29- f=Hkqt  $ABC$  ea  $a + b + c = 25$  vks  $(s - b)(s - c) = x \sin^2 \frac{A}{2}$  gks rks  $x$  dk eku Kkr dja \
- 30-  $\Delta ABC$  ea ; ; fn  $\frac{1}{a+b} + \frac{1}{b+c} = \frac{3}{a+b+c}$  gks rks fl ) djafd  $\angle B = 60^\circ$

**nh?kz mYkjh; f=dks kfefr**

1- fl ) djafd 
$$\frac{\tan\left(\frac{\pi}{4} + \theta\right) - \tan\left(\frac{\pi}{4} - \theta\right)}{\tan\left(\frac{\pi}{4} + \theta\right) + \tan\left(\frac{\pi}{4} - \theta\right)} = \sin 2\theta$$

2- ; fn  $\frac{x}{a} \cos \theta + \frac{y}{b} \sin \theta = 1$  rFkk  $\frac{x}{a} \sin \theta - \frac{y}{b} \cos \theta = 1$  rks fl ) djsfd  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 2$

3- fl ) dja  $\tan 9^\circ - \tan 27^\circ - \tan 63^\circ + \tan 81^\circ = 4$

4- ; fn  $A+B+C = \pi$  gks rks fl ) dja fd  

$$\cos A + \cos B - \cos C = -1 + 4 \cos \frac{A}{2} \cdot \cos \frac{B}{2} \sin \frac{C}{2}$$

5- l ehdj.k gy dja  $\tan \theta + \tan 2\theta + \tan 3\theta = 0$

6- ; fn  $\cos p\theta + \cos q\theta = 0$  gks rks fl ) dja fd  $\theta$  dk foHkklu eku  $\theta = k\pi$  nks

l ekulrj Jf.k; kacukrsg ftuds l oklrj  $\theta = k\pi \frac{2\pi}{p+q}$  vkj  $\frac{2\pi}{p-q}$  gA

7- ; fn fdl h f=Hkqt  $ABC$  ea dksk  $A, B, C$  l ekulrj Js kh ea gks rks fl ) dja

fd 
$$2 \cos \frac{A-C}{2} = \frac{a+c}{\sqrt{a^2-ac+c^2}}$$

8-  $\Delta ABC$  ea ; fn  $b^2 + c^2 = 3a^2$  gks rks fl ) dja fd  $\cot B + \cot C - \cot A = 0$

9- , d ehVj dsf'k[kj l snks ukoka ds voue dksk  $\theta = k\pi 45^\circ$  vkj  $30^\circ$  gA uko f'k[kj ds , d gh vkj gsrFkk ehukj ds vk/kkj l stkus okyh js[kk ij flFkr gA ukoka ds chp dh njh 100 ehVj gA ehukj dh Apkbz Kkr dja

10-  $AB$  , d m/okZkj ehukj gA fl jk  $A$  l ery Hkrie ij gA  $C$   $AB$  dk e/; fclnq gA  $P$  {kfrt Hkrie ij , d fclnq gA Hkx  $CB$  fclnq  $P$  ij dksk  $\beta$  vUrjir djrk gA ; fn  $AP = n \cdot AB$  rks fn [kkb, fd  $\tan \beta = \frac{n}{2n^2 + 1}$

11- fl ) dja fd  $\cos 60^\circ \cdot \cos 36^\circ \cos 42^\circ \cos 78^\circ = \frac{1}{16}$

12- l  $\sin(A-B) = \sin A \cdot \cos B - \cos A \cdot \sin B$  dh LFkki uk dja

13- fl ) dja fd

$$\frac{\sec 8\theta - 1}{\sec 4\theta - 1} = \frac{\tan 8\theta}{\tan 2\theta}$$

14- fl ) dja fd  $\sin 36^\circ \cdot \sin 72^\circ \sin 108^\circ \sin 144^\circ = \frac{5}{16}$

15-  $\sin 18^\circ$  dk eku Kkr dja

16- ; fn  $x+y+z = xyz$  gks rks fl ) dja fd &

$$\frac{2x}{1-x^2} + \frac{2y}{1-y^2} + \frac{2z}{1-z^2}$$

- 17- fuEu l ehđj.k dks gy djs  
 $\sin \theta + \sin 2\theta + \sin 3\theta = 1 + \cos \theta + \cos 2\theta$
- 18- fl ) dja &  
 $b \cos B + c \cos C = a \cos(B - C)$
- 19- fl ) dja &  
 $\frac{a-b}{a+b} = \tan \frac{A-B}{2} \cot \frac{A+B}{2}$
- 20-  $\Delta ABC$  ea fl ) dja fd  
 $\frac{\cos 2A}{a^2} = \frac{1}{a^2} - \frac{1}{b^2}$
- 21- ; fn fdl h  $\Delta ABC$  ea  $\frac{\cos A}{a} = \frac{\cos B}{b} = \frac{\cos C}{c}$  gks rks fl ) dja fd og l eckgg  
f=Hkqt gkskA
- 22-  $\Delta ABC$  ea ; fn  $A = \frac{2\pi}{3}, b - c = 3\sqrt{3}$  l eh  $\Delta = \frac{a\sqrt{3}}{2}$  l eh gks rks a dk eku Kkr  
dhft, \
- 23-  $\Delta ABC$  ea fl ) dja fd  $R(a^2 + b^2 + c^2) = abc(\cot A + \cot B + \cot C)$
- 24- fdl h  $\Delta ABC$  ea vk/kkj BC ea lFkr fclnq D vk/kkj dks  $m:n$  ea vlur% foHkDr  
djr k gS rFkk  $\angle BAD = \alpha$   $\angle DAC = \theta$  rks fl ) dja fd  
 $(m+n)\cot \theta = m \cot \alpha - n \cot B$
- 25- fdl h LFkku l s {kSrt l ery ij [km+LrEHk dk mlU; u dksk QgA LrEHk dh  
vkj a njih c<us ij ; g 45° gks tkrk gA vkj i q% b njih c<us ij (90° - θ)  
gks tkrk gA LrEHk dh ApkbZ Kkr dja
- 26- fdl h f=Hkqt dh Hkqt k; s 3% ds vuq kr gS rFkk ml dk {k=Qy 54 l eh gS rks  
f=Hkqt dh Hkqt kvka dh yEckbZ k; Kkr dja
- 27-  $\Delta ABC$  ea ; fn  $\tan \theta = \frac{2\sqrt{ab}}{a-b}$   $\sin = \frac{c}{2}$   $(a > b)$  gks rks fl ) dja fd  $c = (a-b)\sec \theta$
- 28- fdl h  $\Delta ABC$  ea fl ) dja fd  $1 - \tan \frac{B}{2} \cdot \tan \frac{C}{2} = \frac{2a}{a+b+c}$
- 29- ; fn  $a, b, c$  l ekUrj Js kh ea gS rks fl ) dja fd  $1 - \tan \frac{A}{2} \cdot \tan \frac{C}{2} = \frac{1}{3}$
- 30- ; fn fdl h f=Hkqt  $\Delta ABC$  ea  $\frac{\cos A}{a} = \frac{\cos B}{b} = \frac{\cos C}{c}$  gks rks fl ) dja fd og f=Hkqt

I eckgq f=Hkqt gksckA

31- fdl h f=Hkqt  $ABC$  ea fl ) dja fd  $\frac{1}{s-a} + \frac{1}{s-b} + \frac{1}{s-c} - \frac{1}{s} = \frac{4R}{s}$

32- ml f=Hkqt dk {ks=Qy Kkr dja ftl ea  $b = \sqrt{3} + 1, c = 2$  vkj  $\angle A = 60^\circ$

33- fdl h f=Hkqt  $ABC$  ea fl ) dja fd  $R = \frac{abc}{4\Delta}$

34- fdl h f=Hkqt  $ABC$  ea  $\angle A = 30^\circ, \angle B = 60^\circ$  gks rks dk eku Kkr dja A

35- , d  $\Delta ABC$  ea Hkqt k  $BC$  dk e/; fclnq  $D$  gS; fn  $AD$  Hkqt k  $AC$  ds yEcor gS

rks fl ) dja fd  $\cos A \cos C = \frac{2(c^2 - a^2)}{3ac}$

36-  $\Delta ABC$  ea  $\sin A : \sin B : \sin C = 4 : 5 : 6$  gks rks  $\sin A : \sin B : \sin C$  dk eku Kkr dja A

37-  $\Delta ABC$  dh Hkqt k; a, b, c I ekulrj Jskh ea rks fl ) dja fd

$$\Delta = \frac{1}{4} b \sqrt{3(2a-b)(3b-2a)}$$

38-  $\Delta ABC$  ea fl ) dja fd  $\frac{(a-c)\cos B}{(b-c)\cos A} = \frac{\sin B}{\sin A}$

39- , d LrEHk ds v/kkj dh vkj {kfrt js[kk ij 60 ehVj pyus ij ml ds fl I j dk mlu; u dsk 38 I s  $45^\circ$  gks tkrk gSA

40- , d ehukj I s 20 ehVj nij fLFkr fclnq I s ehukj ds f'k[kj mlu; u dsk  $45^\circ$  gSA ehukj dh mpkbZ Kkr dja A

## I fn'k chtxf.kr

## vfr y?kqrjh; izu &amp;

- i z1 I fn'k o vfn'k jkf'k; ka dk mnkgj.k n d j i f j Hkkf'kr dhft, A
- i z2 bdkb7 I fn'k dks I e>kb; sA I d r }kj k A
- i z3 ; fn  $\vec{a} = 3\hat{i} - 6\hat{j} - 2\hat{k}$  o  $\vec{b} = 7\hat{i} - 8\hat{j} - 9\hat{k}$  g\$ rks  $|3\vec{a} - \vec{b}|$  Kkr dhft; sA
- i z4 I fn'k  $5\hat{i} - 5\hat{j} - \hat{k}$  dh yEckbZ Kkr dhft, A
- i z5 I fn'k  $2\hat{i} - \hat{j}$  ds I ek rj , dkd I fn'k Kkr dhft, A
- i z6 I fn'k  $\vec{a} = 3\hat{i} - 6\hat{k}$  gks rks , dkd I fn'k Kkr dhft, A
- i z7 ; fn fclnq  $(a, n)$  dk I fn'k  $|\vec{a}| = 15$  gks rks  $n$  dk eku Kkr dhft, A

## y?kqrjh; izu &amp;

- i z1 I fn'kka ds izdkj crkdj mlga Li "V dhft, A
- i z2 I fn'kka ea d e f o f u e s r k d k s f l | dhft, A
- i z3  $\vec{a} + (-\vec{a}) = \vec{0} = (-\vec{a}) + \vec{a}$  fl ) dhft; sA  
rFkk crkb; sA ; g i f d z k I fn'kka ds f d l x q k k d k s n ' k k z h g A
- i z4 ; fn  $PQRS$  , d p r h k q t z g k s r k s  $\overline{PQ} + \overline{QR} + \overline{RS} + \overline{SP}$  dk eku D; k gksck A
- i z5 fl ) dhft, f d l h f = H k q t d h f d l u g h n k s H k q t k v k a d s e / ; f c l n q / k a d k s f e y k u s o k y h j s [ k k ] r h l j h H k q t k d s I e k a r j o m l d h v k / k h g k s r h g A
- i z6 fl ) dhft, f d f c l n q  $P(1, 2, 4)$   $Q(2, 5, -1)$  v k s  $R(3, 8, -6)$  I j s [ k h ; g s \
- i z7 ; fn  $a, b, c$  d k s r h u v ' k k ; ] v l e r y h ; I f n ' k g \$ r k s f u E u I f n ' k k a d s c h p I j s [ k h ; I a z k K k r dhft, A

$$a - 2b + 3c] \quad 2a - 3b + 4c] \quad 3a - 4b + 5c] \quad 7a - 11b + 15c$$

i z8 ; fn  $a = i + 2j + 2k, b = 3i + 6j + 2k, c = 2i + j - k$  rks crkb; s

$\frac{1}{\sqrt{11}}$  I fn'k ftl dk ifj.kke  $\sqrt{11}$  o fn'kk I fn'k  $(-a+b-2c)$  dh fn'kk ea gkA

i z9 fclnq  $A, B, C, D$  dsfy, fLFkfr I fn'k dE'k%  $a, b, 2a+3b$  vkj  $a-2b$  gS rks  $\overline{DB} + \overline{AC}$  dk eku crkb; A

i z10  $5\vec{i} + 2\vec{j} - 2\vec{k}$  ,  $8\vec{i} - 5\vec{j} - 4\vec{k}$  dk ; kx ,  $\vec{0}$  varj Kkr dhft, A

i z11 I fn'k fof/k I sfl ) dhft, fd  $f = \text{Hkqt}$  dh ekf/; dk, s, d nu js dks 2% ea foHkDr djrh gA

i z12 ; fn I fn'k  $5\vec{i} - 10\vec{j} - 10\vec{k}$  fdl h  $f = \text{Hkqt}$  dh , d Hkqt k dks fu: fir djrk gS og ml Hkqt k ds I keus okys 'kh'kz I smI Hkqt k dh yEcoRrh; njih 6 gS rks ml  $f = \text{Hkqt}$  dk  $\{k = Qy$  Kkr dhft, A

### nh'kz mRrjh; i zu &

i z1 I fn'k fof/k I sfl ) dhft, fd fdl h prHkqt dh vkl uu Hkqt kvka ds e/; fclnq/ka dks feykus I s cuk prHkqt , d I ekarj prHkqt gA

i z2 fl ) dhft, fd fclnq  $P [1]2[3] Q [3]4[7] \frac{1}{2}$  vkj  $R (-3, -2, -5)$  I js[kh; fclnq gS vkj crkb; s  $Q \perp PR$  dks fdl vuq kr ea foHkfrtr djrk gA

i z3 fl ) dhft, fd ; spkj fclnq  $2a+3b-c, a-2b+3c, 3a+4b-2c, a-6b+6c$  I eryh; gA

i z4 , d prHkqt  $ABCD$  fd fod.kz  $AC$  o  $BD$  ds e/; fclnq dE'k%  $P$  vkj  $Q$  gSA rks n'kkb, fd  $\overline{AB} \perp \overline{AD}, \overline{CB} \perp \overline{CD}$  dk ifj.kkeh I fn'k  $4\overline{PQ}$  gkskA

i z5  $f = \text{Hkqt } ABC$  dh Hkqt kvka ds e/; fclnq dE'k%  $D, E$  vkj  $F$  gA ; fn  $O$  dkbz fclnq gk; rks fl ) dhft,

$$\overline{AD} + \frac{2}{3}\overline{BE} + \frac{1}{3}\overline{CF} = \frac{1}{2}\overline{AC}$$



i z6  $ABCD$ , d l ekrj prkzt gS bl dh Hkqt kvka  $AB$  vks  $BC$  dse/; fclnq  $E$  o  $F$  gA fl ) dhft, fd  $DE$  vks  $DF$  fod. lz  $AC$  dks l ef=Hkkx gA

i z7  $A$  rFkk  $B$  ds fLFkr l fn'k de'k%  $\vec{a}$  vks  $\vec{b}$  gA, d fclnq  $C$  dh fLFkr l fn'k Kkr dhft, tks  $AB$  dks vks c<kus ij l fn'k Kkr dhft, tks  $AC=3AB$  rFkk, d fclnq  $D$  dk fLFkr l fn'k Kkr dhft, tks  $BA$  dks vks c<kus ij bl izkj fLFkr gSfd  $BD=2BA$

i z8 dhft, ; fn  $\vec{a}$  vks  $\vec{b}$  dks znks l ej[ kh; l fn'k gS rks  $\vec{a}$  vks  $\vec{b}$  ds l ery ea fLFkr fdl h l fn'k  $\vec{r}$  dks  $\vec{a}$  rFkk  $\vec{b}$  ds vfn'k xqkuQy ds; kx ds: i ea, d vks  $d\vec{a} + y$ , d izkj, d izkj l s 0; Dr fd; k tk l drk gS vFkkZr  $\vec{r} = x\vec{a} + y\vec{b}$  tgl; x]y mfr vfn'k gA

## bdkbZ 6

### dyu"KL=z] Qyu ] I hek rFkk I krR;

*Calculus function, limit and continuity*

#### vfry?kq dkjkrEd iz'u

nSud thou l sl cfi/kr

i z 1 , d snksmngj .k nhft , ftuea , d jkf" k dk eku nll jh jkf" k ij fuHkj djrk gA tS smngj .kkFkZ fctyh dk fcy] [kpZ Unit fctyh ij fuHkj djrk gA

i z 2 Qyu dks ifjHkf"kr dhft , A

i z 3 rRI ed Qyu ds dkbZ nksmngj .k nhft , A

i z 4  $\sin x$  dk jst crkb, A vki usbl sdS sKkr fd; kA

i z 5  $f(x) = \frac{1}{x}$  ;  $x \in N$  dsfy, jat crkb, A

i z 6 I eQyu dksmngj .k eaeku j [kdj Li"V dhft , A

i z 7 ; fn  $f(x) = \sin x + \cos x$  dsfy,  $x$  ds foHkUk  $\frac{1}{\sqrt{2}}$  eku crkb,

i z 8 fuEu Qyuks ds Mksu o jat Kkr dhft ,

$$\text{i} \frac{1}{2} \quad f(x) = \frac{3+x}{3-x}$$

$$\text{ii} \frac{1}{2} \quad f(x) = \cos^x$$

$$\text{iii} \frac{1}{2} \quad f(x) = \frac{x^2 - 5x + 6}{(x-2)}$$

#### vfR y?kqRrjh;

i z fuEu Qyuks dh I hek crkb,

$$\text{i} \frac{1}{2} \quad \lim_{x \rightarrow 0} \frac{\sin x}{x}$$

$$\text{ii)} \quad \lim_{x \rightarrow 0} \cos x$$

$$\text{iii)} \quad \lim_{x \rightarrow 0} \frac{\tan x}{x}$$

ii)  $\lim_{x \rightarrow 0} \left( \frac{\sin 2x}{x} \right)$  is equal to  $\lim_{x \rightarrow 0} \frac{\sin 2x}{2x} \cdot 2$

### Example 1: Find

i)  $f(x) = x^3 + 3x - 4\sin^3 x$

$$\text{ii)} \quad f(x) = (4x)^2 - 2\cos x$$

$$\text{iii)} \quad f(x) = 5x^6 - 4\tan^4 x + 3\cos^2 x$$

$$\text{(iv)} \quad f(x) = x^3 - 3x \cos x + 5x$$

ii) ; fn  $f(x) = x^3 - \frac{1}{x^3}$  rks  $f(x) + f\left(\frac{1}{x}\right)$  dk eku Kkr dhft, A

iii) fuEu Qyu  $f(x) = \frac{x^2 + 2x + 1}{x^2 - x - 6}$  dsfy, domain Kkr dhfy, A

iv) ; fn  $f(x) = 2x\sqrt{1+x^2}$  gks rks fl ) dhft, fd &

$$f\left(\sin \frac{x}{2}\right) = \sin x$$

v) eki d Qyu dk xkQ cukb, A

vi)  $f(x) = \frac{-1}{x}$  dsfy, xkQ fu: fir dhft, A

vii)  $\tan x$  Qyu dk xkQ cukb, A xkQ ds xqk o Qyu ds xqk dks I kj .kh }kjk I e>kb, A

1/8 1/2  $f(x) = \sin x \quad x \in R$  rFkk  $g(x) = x^2 \quad x \in R$  rksfl ) dhft, fd  $(g \circ f)x \neq (f \circ g)x$

**y?k?Rrjh; i?u**

i?  $Q$ yu dh I hek dk vFkZ Li "V dhft,

i? fl ) dhft, fd &

$$\lim_{x \rightarrow 2} \frac{\sqrt{1+x} - \sqrt{1-x}}{x} = 1$$

i? I hek, aKkr dhft, &

$$1/11/2 \quad \lim_{x \rightarrow 2} \left( \frac{x^8 - 16}{x^4 - 4} + \frac{x^2 - 9}{x + 3} \right)$$

$$1/21/2 \quad \lim_{h \rightarrow 0} \frac{\sqrt{x+h} - \sqrt{x}}{h}$$

$$1/31/2 \quad \lim_{x \rightarrow 0} \left( \frac{1}{x-1} + \frac{1}{1-x} \right)$$

$$1/41/2 \quad \lim_{x \rightarrow 0} \frac{(1-x)^n - 1}{x}$$

$$1/51/2 \quad x^{\sin} \rightarrow a \frac{(x+5)^{7/2} - (a+5)^{7/2}}{x-a}$$

$$i? \quad \lim_{x \rightarrow 0} \left( \frac{\tan^2 x}{4x^2} + \cos^2 x \right) \text{ dk eku fudkfy, } A$$

$$i? \quad \lim_{x \rightarrow 0} \frac{e^{\sin x} - 1}{x} = 1$$

**nh?k?Rrjh; i?u&**

$$1/11/2 \quad f(x) = \frac{1}{\sqrt{x-5}} \text{ dk domain vks } Range \text{ crkb, } A$$

12½ ; fn  $f(x) = y = \frac{ax-b}{cx-a}$  rksfl ) dhft, fd  $f(y) = x$

13½ fuEu Qyu  $f(x) = \sin^{-1}(2x+1)$  dk domain 0 Range Kkr dhft,

14½  $f(x) = \frac{|x|}{x}$  Qyu dsfy, xkQ cukb, A D; k ; g Qyu  $x=0$  ij ifjHkkf"kr gA

15½ ; fn  $\lim_{x \rightarrow 1} \frac{x^4-1}{x-1} = \lim_{x \rightarrow k} \frac{x^3-k^3}{x^2-k^2}$  gks rks  $k$  dk eku Kkr dhft,

nh?kzRrjh; i' u&

11½  $\lim_{x \rightarrow \frac{\pi}{2}} \frac{1-\sin x}{\left(\frac{\pi}{2}-x\right)^2}$  dk eku Kkr dhft,

12½  $\lim_{x \rightarrow 1} \frac{1-\sqrt{x}}{(\cos^{-1} x)^2}$  dk eku Kkr dhft,

13½ iEs  $\lim_{x \rightarrow \infty} \left(1 + \frac{1}{x}\right)^x = e$  dh mRi fRr dhft, A