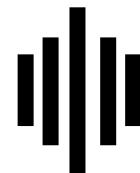




xf.kr



d{kk IX



I Eiy itu&i=

1/fo | k\$pr bdkb1/
NÜkh! x<+ek/; fed f'k{kk e.My] jk; ig

itū & i= dh ; kṣtuk Scheme of Question Paper

fo"k; % xf.kr

i wklid % 100

I e; % 3 ?ka/s

i jh{kk % gkbz Ldy

॥॥ 'kskf.kd mnas ; ds vuq kj eku

(A) Weightage as per Educational objective:

I 0 Ø0	mnas ;	vd	i fr'kr
1-	Kku (Knowledge)	20	20%
2-	vocksk (Understanding)	60	60%
3-	vuijz kx ,oa dksky (Application & Skill)	20	20%
; kx		50	100%

॥॥ bdkbdkj vdkls dk eku

I 0Ø0	bdkbz dk uke	bdkbz ij vkcVr vd	i tū&i= ds ik: i vuq kj vkcVr vd
1-	chit xf.kr	26	26
2-	okf.kfT; d xf.kr	08	08
3-	fundkd T; kfefr	07	07
4-	f=dks kfefr	15	15
5-	{ks fefr	10	10
6-	T; kfefr	19	19
7-	dEl; Wj	05	05
8-	I kf[; dh	10	10
9-			
10-			
11-			
12-			

॥ ፳ ዓይነት ስርዓት ስርዓት (Difficulty Level)

10 ØO	mnas ;	vd	i fr'kr
1-	I jy (Easy)	20	20%
2-	vld r (Average)	60	60%
3-	dfBu (Difficult)	20	20%
		; kx	100
			100%

የክፍል ከተማ = fn'kk funsk ,oa fodYi ; kst uk %

(Instruction's & Scheme of Option for Question Paper)

- oLrfu"B itu e@105% cgfodYih; itu rFkk 105% fjDr LFKku dh i fr@mfpr tkMh cuk, dk itu fn; k tkosk vks ; g iR; d l V e@itu Øekd 1 gksk A
- iR; d l V e@1] 2 ,oa3 vdks ds ituka e@fHkkurk jgsxh A l eLr 04 vd ; k bl l s vf/kd vdks ds y?kmÙkjh; rFkk nh?kmÙkjh; ituka e@fodYi fn; k tkuk gSA fodYi itu ml h bdkbz l srFkk l eku mnas ; kadsjgxsA 04 vd ; k bl l s vf/kd vdks ds itu iR; d l V e@,d l eku jgsxh A
- vf/kdre mÙkj l hek vfry?kmÙkjh; 1/2 vd@30 'kCn½/3 vd@50 'kCn½
y?kmÙkjh; 1/4 vd@75 'kCn½/5 vd@150 'kCn½
nh?kmÙkjh; 1/6 vd ; k vf/kd@250 'kCn½

itu & i= dk Cyfi IV

Blue Print of Question Paper

fo"k; % xf.kr

i wklid % 100

I e; % 3 ?ka/s

i jh{k% gkbLdy

bdkbz 1 -Ø-	bdkbz	bdkbz ij vkcflVr vd	vdokj itu							dy itu ; k bl ls vf/kd
			1 vd	2 vd	3 vd	4 vd	5 vd	6 vd	7 vd	
1	chtxf.kr	26	2	2	3	&	1	1	&	7\$1
2	okf.kT; xf.kr	08	&	&	1	&	1	&	&	02
3	fun{kld T; kfefr	07	1	1	&	1	&	&	&	02
4	f=dks kfefr	15	2	1	1	2	&	&	&	04
5	{ks-fefr	10	1	1	1	1	&	&	&	03
6	T; kfefr	19	2	1	&	1	1	1	&	04
7	dEl; Wj	05	1	2	&	&	&	&	&	02
8	I kf[; dh	10	1	&	&	1	1	&	&	02
9										
10										
11										
12										
	; ks	100	1 10½	8	6	6	4	2	&	27

Set - A

gkbz Ldy | fMOdV ijhkk

High School Certificate Examination

| fiy&itu i=

SAMPLE PAPER

fo'k; % (Subject) - xf.kr (Mathematics)

d{kk % (Class) - nI oh (X)

le; 3 ?k.VK (Time- 3 Hrs)

iWd 100 (M.M.)

(Instruction) & Vunzh

- 1- **I hh itu gy djuk vfuok; ZgSA**

Attempt all the Question

- 2- **itu Øekd 01 ea 10 vd fu/kkrjr gSA nks mi [k.M gSA [k.M ^v** ea 05
cgfodYih; itu rFkk [k.M ^c** ea 05 fjDr LFkkuk dh ifrZ vFkok mfpr
I cak tkSM, A iR; d itu dsfy, 1 vd vkcfVr gSA**

Q. No. 01 Carries 10 Marks. There are two sub-section, Section A is Multiple choice carries 05 marks and section B is fill in the blanks or match the column carries 05 marks.

- 3- **itu Øekd 02 l situ Øekd 09 rd vfr y?kmRrjh; itu gSA iR; d itu
ij 02 vd vkcfVr gSA mRrj dh vf/kdre 'kCn I hek 30 'kCn A**

Q. No. 2 to 09 are very short answer type question & it carries 02 marks each. Word limit is maximum 30.

- 4- **itu Øekd 10 l situ Øekd 15 rd y?kmRrjh; itu gSA iR; d itu ij 03
vd vkcfVr gSA mRrj dh vf/kdre 'kCn I hek 50 'kCn A**

Q. No. 10 to 15 are short answer type question & it carries 03 marks each. Word limit is maximum 50.

- 5- **itu Øekd 16 l situ Øekd 21 rd y?kmRrjh; itu gSA iR; d itu ea
vkrfjd fodYi gSvkj iR; d itu ij 04 vd vkcfVr gSA mRrj dh vf/kdre
'kCn I hek 75 'kCn A**

Q. No. 16 to 21 are short answer type question & it carries 04 marks each. Each question has internal choice. Word limit is maximum 75.

6- itu Øekd 22 Is itu Øekd 25 rd nh?kñRrjh; itu gSA iR; d itu e
vkrfjd fodYi gSvkj iR; d itu ij 05 vd vkcVr gSA mRrj dh vf/kdre
'kCn I hek 100 'kCn A

Q. No. 22 to 25 are long answer type question & it carries 05 marks each. Each question has internal choice. Word limit is maximum 100.

7- itu Øekd 26 Is itu Øekd 27 rd nh?kñRrjh; itu gSA iR; d itu e
vkrfjd fodYi gSvkj iR; d itu ij 06 vd vkcVr gSA mRrj dh vf/kdre
'kCn I hek 150 'kCn A

Q. No. 26 to 27 are long answer type question & it carries 06 marks each. Each question has internal choice. Word limit is maximum 150.

it u 1 $\frac{1}{4}$ gh fodYi pfu, %

- (i) 7] 9] 21 dk PkrkfkukkkRkh g $\frac{1}{2}$
 (a) 27 (b) 21 (c) 18 (d) 36
- (ii) 120° dk jSM, kUk Eka Ekkuk g $\frac{1}{2}$
 (a) $\frac{\pi}{2}$ (b) $\frac{\pi}{3}$ (c) $\frac{\pi}{4}$ (d) $\frac{2\pi}{3}$
- (iii) okuk/kz dk dks k g $\frac{1}{2}$ kk g $\frac{1}{2}$
 (a) 60° (b) 90° (c) 120° (d) 180°
- (iv) 8 dk f}vk/kkj h lkz kkYkh Eka Ekkuk g $\frac{1}{2}$ kk&
 (a) 100 (b) 1000 (c) 1010 (d) 1001
- (v) , d fLkDds dks mNkYkks lkj ' kh" kz vkuks ch lkf, kDRkk g $\frac{1}{2}$ kh&
 (a) 1 (b) $\frac{1}{2}$ (c) $\frac{2}{3}$ (d) $\frac{1}{4}$
- (A) Choose the correct answer -
- (i) Fourth proportional of 7, 9 and 21 is -
 (a) 27 (b) 21 (c) 18 (d) 36
- (ii) Value of 120° in radian is -
 (a) $\frac{\pi}{2}$ (b) $\frac{\pi}{3}$ (c) $\frac{\pi}{4}$ (d) $\frac{2\pi}{3}$
- (iii) Angle of semi circle is -
 (a) 60° (b) 90° (c) 120° (d) 180°
- (iv) Valur of 8 in Binary number is -
 (a) 100 (b) 1000 (c) 1010 (d) 1001

(v) The probability of getting heads in a throw of a coin is -

½k½ fjDRk LFkkUkka dh lkRkZ dhft , &

- (i) $2 \sqrt{5} \cdot 10 \text{ dk LkEkkRkj Ekk/}_{\text{,k}} \text{ ----- gkXkk A}$ 1½

(ii) $\text{fukn}_{\text{k}} \text{ kkd } (-a, -b) \text{ ----- PkRkFkkaLk Eka fLFkRk gkXkkA}$ 1½

(iii) $1 + \tan^2 \theta \text{ } \frac{3}{4} \text{ ----- gkXkk A}$ 1½

(iv) $?kuk \text{ ds dkjks dh Lka}_{\text{,kk}} \text{ ----- gkRkh gA}$ 1½

(v) $3] \text{ } 4 , \text{oka } 5 \text{ LksEkh- HkqTkk OkkYks f«kHkqTk dks ----- f«kHkqTk dgRks gA}$ 1½

(B) Fill in the Blanks -

- (i) Arithmetic means of 2 and 10 is
 - (ii) Co-ordinate $(-a, -b)$ lies on quadrant.
 - (iii) Value of $1 + \tan^2 \theta$
 - (iv) Number of edges in cube is
 - (v) Triangle whose sides are 3 cm., 4 cm. and 5 cm. called triangle.

$$\frac{x^2+1}{x^2-1} \sqrt{5} \frac{x+1}{x+2} \text{dk} \quad \text{kkkQYk KkRk djks A} \quad 12/1$$

Find the sum of $\frac{x^2+1}{x^2-1}$ and $\frac{x+1}{x+2}$

$$\text{Lkz Ukk } 3- \quad x^2 + 7x = -12 \text{ ds Ekrk Kkrk dhfTk, A} \quad 12\%$$

Find the roots of $x^2 + 7x = -12$

Ques 4 $\frac{\cos 51^\circ}{\sin 39^\circ}$ dñ Ekkuk Kkrk dhfTk, A 1½

Find the value of $\frac{\cos 51^\circ}{\sin 39^\circ}$

Ques 5- $\sqrt{2^2 + 6^2} = \sqrt{40} = 2\sqrt{10}$ dñ CkhPk dh njh Kkrk dhfTk, A 1½

Find the distance between (-2, 6) and (3, -6).

Ques 6 , dñ Yek fckhkh tkh, k fiktek ds vklkj dh lkfj Ekkuk 30 LksEkh- vks Åpkkbz 5 LksEkh- gks Rkks mLkdk lkk' okz lk"b Kkrk dhfTk, \ 1½

Find the lateral surface of prism whose height is 5 cm. and perimeter of base is 30 cm.

Ques 7 ΔABC Eka DE||BC Rkfkk AD ¾ 3 DB ¾ 5 Lks-Ekh- AC ¾ 12 LksEkh- gks Rkks AE dñ Ekkuk Kkrk djksA 1½

In ΔABC] DE||BC, AD = 3cm. DB = 5 cm. and AC = 12 cm. Find the value of AE.

Ques 8 vYxksjFe dñ lks lkfj Hkkf"krk dhfTk, A 1½

Define algorithm.

Ques 9- 15 Eka Lks 40 dñks ?kvkb, ks lkj dñ lk) frk Lks A 1½

Subtract 15 from 45 by complement theory.

Ques 10 $lkfj Eksk 0, ktkd \frac{7x}{x^2 + x - 12}$ Eka Lks D, kk ?kvkb, kk Tkk, k fd lkfj . kkek $\frac{4}{4+x}$ lkkrk gks 1½

What should be subtract from $\frac{7x}{x^2 + x - 12}$ to get $\frac{4}{4+x}$.

Ikz Uk 11 Js kh 3] 8]13] 18]----- dk dk Lkk lkn 498 gA 13½

Which term of the series 3, 8, 13, 18 is 498.

Ikz Uk 12 ; fn $\frac{x+y}{x-y} = \frac{2}{3}$ gks rks x:y dk eku Kkr djka 13½

If $\frac{x+y}{x-y} = \frac{2}{3}$ then find the value of x:y .

Ikz Uk 13 fLk) dhfTk, & 13½

Prove that :

$$\sec \theta - \tan \theta = \frac{1 - \sin \theta}{\cos \theta}$$

Ikz Uk 14 , d 'kdq dk 0, kkLk 12 LksEkh vks ÅpkkbZ 6 Lkekh gS Rkks 'kdq dh fr, kd ÅpkkbZ Kkrk dhfTk, A 13½

The diameter of a cone is 12 cm. and height 6 cm. Find the slant height of the cone.

Ikz Uk 15 EkkgUk Uks Nf"k fokdkLk ckf Eka 50000 : lk,ks dk 2 ok"kZ dsfYk, Lkkdkf/k TkEkk fd, kka ,kfn C,kkTk dh nj 10 lkfrk'krk okf"kd gks Rkfkk C,kkTk lkfrk N% Ekkg Ckkn LkqkksTkrk gkRks gS Rkks lkfj lkDdkRkk lkj ckf mLks fdRkukk /kuk nkk A 13½

Mohan deposit Rs. 50000 in Krishi Vikas Bank for 2 year in fixed deposite account. If the rate of interest is 10% p.a., then calculate the maturity amount if the interest is compounded half yearly.

Ikz Uk 16 a ds fdLk EkkUk dsfYk, fcknq 1/4]4½] 1/2, & 2½ vks 1/3]16½ Lkejs[k gkks & 1/4½

For what value of a, the point (1, 4), (a - 2) and (-3, 16) will be colliner.

1/4Fdkk½ (OR)

mLk f«kHkT_k dk d₁₂₃ KkRk dhfTk, fTkLkds 'kh"kk₃ ds fulkn₃ kk₁ 1/4] 3/4 1/2] & 3/4
 1/3] 5/2 gA

Find the centroid of a triangle whose vertices are (4, 3), (2, -3) and (-3, 5).

Ikz U_k 17 fdlkh f«kHkT_k ds dks k LkEkk_kj Js kh Eka gS LkCkLks CkMs dks k dk Ekkuk 105° gSRkhUkka
 dks kka ds Ekkuk dk jSM_{,kuk} Eka KkRk dhfTk, A 1/4½

The angles of a triangle are in A.P. The biggest angle is 105°. Find the angles in radian.

1/4Fkokk½ (OR)

, d f«kHkT_k ds dks k 2/3/4 Eka gS A f«kHkT_k ds dks kka ds Ekkuk jSM_{,kuk} Eka KkRk dhfTk, A

The angles of a triangle are in the ratio 2 : 3 : 4. Find the measures of angles in radian.

Ikz U_k 18 $x = a \sec \theta$ Rkfkk $y = b \tan \theta$ gks Rkks fLk) dhfTk, fd $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$. 1/4½

If $x = a \sec \theta$ and $y = b \tan \theta$ then prove that : $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$

1/4Fkokk½ (OR)

, kfn $x = a \cos \theta - b \sin \theta$ Rkfkk $y = a \sin \theta + b \cos \theta$ gks Rkks fLk) dhfTk, fd $x^2 + y^2 = a^2 + b^2$.

If $x = a \cos \theta - b \sin \theta$ and $y = a \sin \theta + b \cos \theta$ then prove that : $x^2 + y^2 = a^2 + b^2$.

Ikz U_k 19 mLk CkMs Lks CkMs 'kdq dk v_k, kRkuk KkRk dhfTk, Tkks mLk ?kuk Eka Lks dkV_k X_k, kk gS fTkLkd_h dksj YkdkkbZ 3 LksEkh- gA 1/4½

Find the volume of the greatest cone which can be cut from a cube whose edge is 3 cm.

1/4 Fokk½ (OR)

fdLkh Xkkks dk lk" Bh,k {kkQYk 616 okxz LkEkh gks Rkks Xkkks dk vkrkrk Kkrk dhfTk, A

The curved surface of sphere is 616 cm^2 then find the volume of sphere.

Ikzuk 20- nks LkEkh fckhTka ds {kkQYk dk vukrkrk fdugha nks Lkkrk Hkqkkvka ds okxkk ds vukrkrk ds ckjckj gkks gA 1/4½

Prove that the ratio of the areas of two similar triangles is equl to the ratio of the squares of any two corresponding sides.

1/4 Fokk½ (OR)

Fkylk lkEksk fykf[k, , oka fLk) dhfTk, A

State and prove that Thales theorem.

Ikzuk 21- , d FkYks Eka 4 dkYkh] 5 YkkYk] Rkfkk 7 LkQsn Xkn gA , kfn , d Xkn , kknPN, kk fukdkYkh Tkk,k Rkks bLkdh lkf,kdRkk D,kk gkXkh fd fukdkYkh XkbZ Xkn & (i) LkQsn gkXkh (ii) LkQsn , kk dkYkh A

A bag contains 6 black, 5 red and 7 white balls. If one ball is drawn at random. What is probability that the ball drawn will be - (i) White, (ii) White or black.

1/4 Fokk½ (OR)

vPNh lkdkj LksQjh XkbZ52 Rkk'kkad , d XkMMh EkaLks , d Rkk'k , kknPN, kk [khdkk Tkkrkk g\$ Rkks fukELk dh lkf,kdRkk Kkrk dhfTk, A

(i) , d iku dk rk'k gkA (ii) iku ; k bV dk , Ddk gkA

From a well shuffled pack of 52 cards, one card drawn at random. Find the probability of the following -

- (i) One card is of heart
- (ii) Ace of heart or diamond.

Ques 22 If $x = \frac{3ab}{a+b}$ gks Rkks fLk) dhfTk, fd $\frac{2x+3a}{2x-3a} + \frac{2x+3b}{2x-3b} = 2$. 15½

If $x = \frac{3ab}{a+b}$, then prove that $\frac{2x+3a}{2x-3a} + \frac{2x+3b}{2x-3b} = 2$

Ans (OR)

Rkhuk LKEKKURKkj Jf.k, kka ds n lknka dk ,kkQYk ØEk' k% S₁, S₂, S₃ gA fTkuds lkEKEk lkn 1] 2] 3 RkFkk LkkOKRkj ØEk' k% 1] 3] 5 gA Rkks fLk) dhfTk, fd &

$$S_1 + S_2 + S_3 = \frac{3}{2}(3n+1)n$$

If S₁, S₂, S₃ be the sum of n terms of three A.P. and their first terms are 1, 2, 3 respectively and common difference are 1, 3, 5, then prove that

$$S_1 + S_2 + S_3 = \frac{3}{2}(3n+1)n \quad 15½$$

Ques 23 ?kuk' ,kkEk dk Ekvk okRkuk lkfrKEkkg 12500 : lk,ks gA RkFkk EkgXkkbZHkjk lkfrKEkkg 6300 : lk,ks lkRk djRkk gSA ,kfn okg LkKEKKU,k Hkfok" ,k fukf/k Eka lkfrKEkkg 2000 : -] th vkbZ, l - ea lkfrKEkkg 250 : - RkFkk HkkjRkh,k Tkholuk CkhEkk lkfrEk,kEk Eka lkfrkok" kZ 69000 : - ,oa Mkd?kj Tkholuk CkhEkk lkfrEk,kEk lkfrkok" kZ 10000 : - TkEkk djRkk gSA mLkds }kjk nsk dYk vklkj KkRk dhfTk, A 15½

Basic salary of Ghanshyam is Rs 12500 per month and D.A. is Rs. 6300 per month. He invests Rs. 2000 per month in G.P.F., Rs. 250 per month in G.I.S. and Rs. 69000 yearly as annual premium to L.I.C. and also Rs. 10000 yearly in post office L.I.C. premium. Calculate the in-

come tax paid by him?

Rate of income tax :

upto Rs. 1,10,000	nil
From Rs. 1,10,001 to 1,50,000	10%
From Rs. 1,50,001 to 2,50,000	20%
above Rs. 2,50,000	30%

Educational cess : 3% of the total payable income tax and surcharge.

$\frac{1}{4}\sqrt{Fk0}k\frac{1}{2}$ (OR)

'kkfYkUkh dh Okkf"kd v{k,k 1Ekdkuk fdjk,kk HkRRkk NkMdj½ 1]80]000 : lk,ks gA ,kfn
Okg LkEkkU,k Hkfok",k fukf/k Eka lkfRkOk"kd 40000 : lk,k\$ LkEkg Tkhokuk CkhEkk ,kksTkuKK Eka
250 : lk,ks lkfRkEkkg Rkfkk 5000 v) Z Okkf"kd Tkhokuk CkhEkk lkkfYkI h Eka fd'Rk Tkekk
djRkh gA Kkrk dhfTk, fd 'kkfYkUkh dks v{kkuks v{k,kd{j mIk fokUkh,k Ok"kd fdRkuKK
v{k,kd{j n{kk gk{kkA

The annual income of Mrs. Shalini (Excluding HRA) is Rs. 180000. If she deposits Rs. 40000 per year in G.P.F., Rs. 250 per month in G.I.S. and Rs. 5000 half yearly premium towards L.I.C. Calculate her income tax payable in the financial year.

Rate of income tax :

upto Rs. 1,10,000	nil
From Rs. 1,10,001 to 1,50,000	10%
From Rs. 1,50,001 to 2,50,000	20%
above Rs. 2,50,000	30%

Educational cess : 3% of the total payable income tax and surcharge.

Ikz Uк 24 f_кh_кh_кT_к ΔLMN dh j PkUkk dhfTk, Tkgk_к MN = 5 LksEkh] ∠L = ∠55° v k_к L
Lks MкYkk Xk_кkk ' kh"кz Yk_кk 3-5 LksEkh- gkA j PkUkk ds lkn Hkh fYkf[k, A

Construct $\triangle LMN$ in which $MN = 5$ cm., $\angle L = 55^\circ$ and perpendicular

from L is 3.5 cm. Write steps of construction.

1/4 Fokk½ (OR)

, d PkØh, k PkrklikTk ABCD dh jPKUkk dhfTk, fTkLkEka $\angle ABC = 90^\circ$, AC ¾ 6 LksEkh] AB ¾ 3 LksEkh] CD ¾ 3.6 LksEkh- jPKUkk ds lkn Hkh fyk [kkA

Construct a cyclic quadrilateral $ABCD$ in which $\angle ABC = 90^\circ$, $AC \frac{3}{4} 6$ cm., $AB \frac{3}{4} 3$ cm., $CD \frac{3}{4} 3.6$ cm. Write steps of construction.

Ikzuk 25- fukeuk Lkkj .kh Lks Ekkf / kdk Kkrk dhfTk, & 15½

0&10	10&20	20&30	30&40	40&50
4	8	10	11	16

Find the medium of the following table :

Class	0–10	10–20	20–30	30–40	40–50
Frequency	4	8	10	11	16

1/4 Fokk½ (OR)

fukeuk vkdfr c/u Lks cgyd Kkrk dhfTk, &

0&10	10&20	20&30	30&40	40&50	50&60	60&70
8	15	21	37	31	14	12

Find the mode of the following table :

Class	0–10	10–20	20–30	30–40	40–50	50–60	60–70
Frequency	8	15	21	37	31	14	12

Ikzuk 26 , d ok"kz lkz fikRkk dh vk,kq lke dh vk,kq ds 8 Xkjh Fkh vkTk fikRkk dh vk,kq lke dh vk,kq ds okXkz ds Ckjckj gA Rkks mukdh okRkEkkuk vk,kq Kkrk dhfTk, \ 15½

One year ago, a man was 8 times as old as his son. Now his age is equal

to the square of his son's age. Find their present ages.

$\frac{1}{4}\sqrt{Fk0}k\frac{1}{2}$ (OR)

nks ØEkXkRk LkEk Lka, kk, ks KkRk dhfTk, fTkukcls ØkXkkz dk, kk, kk 164 gA

The sum of squares of two consecutive even numbers is 164. Find the numbers.

Ikt lk 27 fLk) dLkfTk, fd fdlkh LkEkCkgq f«kHkT^qk dh fdlkh HkTkk ds OkXkZ ds frkXkTkk mLkdh
ÅpkkbZ ds OkXkZ ds Pkkj XkTks ds Ckj kCkj gkRkk gA ½½

Prove that three times the square of any side of an equilateral triangle is equal to four times the square of the altitude.

$\frac{1}{4}\sqrt{Fk0}k\frac{1}{2}$ (OR)

کن PAB اکلیک dh Nnd jsk gks Tkks اکلیک dks A vks B lkj lkfrkPNn djRkh gS vks PT , d Llk'kz jsk [k.M gks Rkks fLk) dlfTk, PA.PB = (PT)²

If PAB is a secant to a circle which intersecting the circle at A and B and PT is a tangent segment, then show that : $PA.PB = (PT)^2$

1.1.1 y mRrj | v & ,**

mÙkj 1½ ½ ØgøkcdYlh,k mÙkj

- (i) 7] 9] 21 dk PkrkfkkukkkRkh gA ½½
 (a) 27
- (ii) 120 vdk dk jSM,kuk Eka Ekkuk gkk& ½½
 (d) $\frac{2\pi}{3}$
- (iii) ØkÙkk/kZ dk dks k gkk& ½½
 (b) 90°
- (iv) 8 dk f}vk/kkj h lkz kkYkh Eka Ekkuk gkk& ½½
 (b) 1000
- (v) , d fLkDds dks mNkYkUks lkj 'kh"kZ vkUks dh lkf,kdRkk gkk& ½½
 (b) $\frac{1}{2}$
- ½½ fjDRk LFkkUkka dh lkfRkZ,kk mfPkRk Lkaklk TkklMk&
- (vi) 2 vks 10 dk LkEkkkj Ekk/k 6 gkk& A ½½
 (vii) fuknkkd (-a, -b) rrh; Pkrkfkkuk Eka fLFkRk gkk& A ½½
 (viii) $1 + \tan^2 \theta$ $\frac{3}{4} \sec^2 \theta$ gkk& A ½½
 (ix) ?kuk ds dkjs dh Lka,kk 12 gkk& gA ½½
 (x) 3] 4 , Øka 5 LksEkh- Hkqkk ØkYks f \ll Hkqk dk s I edks k f \ll Hkqk dgRks gA ½½

itu 2 lsitu 9 rd ¼ R; sd 2 vd½

mÙkj 2-
$$\frac{x^2+1}{x^2-1} + \frac{x+1}{x+2}$$
 ½½

$$\begin{aligned}
&= \frac{(x^2 + 1)(x + 2) + (x + 1)(x^2 - 1)}{(x^2 - 1)(x + 2)} \\
&= \frac{x^3 + 2x^2 + x + 2 + x^3 - x + x^2 - 1}{x^3 + 2x^2 - x - 2} \\
&= \frac{2x^3 + 3x^2 + 1}{x^3 + 2x^2 - x - 2}
\end{aligned}$$

Mükj 3- $x^2 + 7x = -12$ 1/2%

$$\begin{aligned}
&x^2 + 7x + 12 = 0 \\
&x^2 + 3x + 4x + 12 = 0 \\
&x(x + 3) + 4(x + 3) = 0 \\
&(x + 3)(x + 4) = 0 \\
&\therefore x = -3 \quad ; \quad x = -4
\end{aligned}$$

vr%oxl l eh ds ey &3] &4 gA

Mükj 4 $\frac{\cos 51^\circ}{\sin 39^\circ}$ 1/2%

$$\begin{aligned}
&= \frac{\cos(90^\circ - 39^\circ)}{\sin 39^\circ} \quad \because \cos(90^\circ - \theta) = \sin \theta \\
&= \frac{\sin 39^\circ}{\sin 39^\circ} \\
&= 1
\end{aligned}$$

Mükj 5- $PQ = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ 1/2%

$$\begin{aligned}
&= \sqrt{(3 + 2)^2 + (-6 - 6)^2} \\
&= \sqrt{25 + 144} \\
&= \sqrt{169}
\end{aligned}$$

$PQ = 13$ vr%nkukafchnykschp dh njh 13 l eh gA

mÜkj 6 Ykfk f«kHkqkh,k flkzEk ds vk/kkj dh lkfj EkkIk ¾ 30 LksEkh- vks Åpkkbz ¾ 5 LksEkh-
.: Ykfk f«kHkqkh,k flkzEk lk'okz lk"B ¾ vk/kkj dk ifjeki × Åpkbz

$$= 30 \times 5$$

= 1500x1 LksEkh-

mÜkj 7 Fkyi i es | § ½½

$$\frac{AD}{AB} = \frac{AE}{AC}$$

t gkj AD ¾ 3 I eh- fn; k gA

$$AB = AD + DB = 3 + 5 = 8 \text{ cm}$$

$$AE = ?$$

AC ¾ 12 LksEkh- fn; k gS

∴ eku j [kus i j]

$$\Rightarrow \frac{3}{8} = \frac{AE}{12}$$

$$\Rightarrow AE \times 8 = 3 \times 12$$

$$\Rightarrow AE = \frac{3 \times 12}{8} = \frac{9}{2}$$

$$\Rightarrow AE = 4.5 \text{ cm}$$

A diagram showing a triangle with vertices labeled A at the top, B at the bottom left, and C at the bottom right. A horizontal line segment connects points D on side AB and E on side AC. The segments AD, DE, and EC are solid black lines, while segments DB and DC are dashed black lines.

mÙkj 8 vYxksjFe ;k dyu fof/k 12½

$\frac{1}{4}\frac{1}{2}$ fdI h Hkh I eL; k dks gy djus ds fy, rlfdd vunskha dh Øe i)fr dks vYxkjFe dgrsg

½ fdI h I eL; k dks gy djus ds fy, fuf' pr I ; k ea fun kks ds vu Øe dks
vYxkjFe ¼ k dyu fof/k½ dgtrs gA

15
840
—
825

i like pj.k

\$ 59
—
74

15 15 dk **9 dk ij d

\$ 59 bl ; kx eadkbz gkf l y
74 jklr ughaaksk gA yr%

f}rh; pj.k] 74 dk ij d 3/4 25

bl e8_.k fpulg yxkus i j okNr mRrj 3/4 &25

bl i dkj ?Vko dh ifO; k l keku; i)fr , oaijd i)fr l sikr ifj. kke &25
l eku i klr gsk gA

mUkj 10 ekuk A ?Vkus i j ifj. kke $\frac{4}{4+x}$ lkkrk gkrk gs & 13½

$$\frac{7x}{x^2 + x - 12} \text{ & A } \quad \frac{4}{4+x} \quad \frac{4}{4+x}$$

$$\frac{7x}{x^2 + x - 12} \text{ & } \frac{4}{4+x} \quad \frac{4}{4+x} \quad \text{A}$$

$$\frac{7x(4+x) - 4(x^2 + x - 12)}{(x^2 + x - 12)(4+x)} \frac{3}{4} \quad \text{A}$$

$$\frac{28x + 7x^2 - 4x^2 - 4x + 48}{(x+4)(x-3)(4+x)} \frac{3}{4} \quad \text{A}$$

$$\frac{3(x^2 + 8x + 16)}{(x+4)(x-3)(4+x)} \frac{3}{4} \quad \text{A}$$

mUkj 11 n ok a i n = T_n = a + (n - 1) d 13½

fn; k g & T_n = 498, a = 3, d = 8 - 3 = 5, n = ?

$$498 = 3 + (n - 1) 5$$

$$498 = 3 + 5n - 5$$

$$500 = 5n$$

$$100 = n$$

vr%Jskh ds 100 ok i n dk eku 498 gskA

$$\text{မူလ်j 12} \quad \frac{x+y}{x-y} = \frac{2}{3} \quad 1/2$$

$$3(x+y) = 2(x-y)$$

$$3x + 3y = 2x - 2y$$

$$3x - 2x = 2y - 3y$$

$$\frac{x}{y} = \frac{-5}{1}$$

$$x:y = -5 : 1$$

$$\text{မူလ်j 13} \quad \sec \theta - \tan \theta = \frac{1 - \sin \theta}{\cos \theta} \quad 1/2$$

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

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

$$\text{မူလ်j 14} \quad \text{fn; k g\$ } 2r = 12, r = 6 \quad 1/2$$

$\Delta \text{BCO} \mid \{ \}$

$$l^2 = h^2 + r^2$$

$$= 62 + 62$$

$$= 36 + 36$$

$$l^2 = 72$$

$$l = 6\sqrt{2}$$

$$\text{မူလ်j 15} \quad \text{fn; k g\$ ey/ku } p = 50000 : lk,ks \quad 1/2$$

C; kt dh nj r = 10 ifr'kr okf"kd ¾ 5 ifr'kr N%ekgh ; k v) bkf"kd

I e; n = 2 ok"kl ¾ 4 N%ekgh

$$\text{feJ/ku } A = P \left[1 + \frac{r}{100} \right]^n \mid s$$

$$= 50000 \left[1 + \frac{5}{100} \right]^4$$

$$= 50000 \left[\frac{21}{20} \right]^4$$

$$= 50000 \times \frac{21}{20} \times \frac{21}{20} \times \frac{21}{20} \times \frac{21}{20}$$

$$= 60775.31 : -$$

bl i dkj ekgu dks nks o"kl i 'pkr 60775-31 : - i klr gkskA

mUkj 16 ge tkursgfd ; fn rhu fcunqI ejek gsrksmul scusf=Hqt dk {ks=Qy 'kl; gkskA

$$\Delta dk \{ks=Qy \frac{1}{4} [(x_1y_2 - x_2y_1) + (x_2y_3 - x_3y_2) + (x_3y_1 - x_1y_3)] = 0$$

$$\frac{1}{2} [\{ (1) \times (-2) - (a \times 4) \} + \{ (a \times 16) - (-3) \times (-2) \} + \{ (-3) \times (4) - (1 \times 16) \}] = 0$$

$$\frac{1}{2} [(-2 - 4a) + (16a - 6) + (-12 - 16)] = 0$$

$$\frac{1}{2} [12a - 36] = 0$$

$$12a - 36 = 0$$

$$a = 3$$

1/4 Fkdkh1/2

mUkj 16 f=Hqt dk dnd (h, k) = $\left(\frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3} \right)$

$$h = \frac{x_1 + x_2 + x_3}{3} = \frac{4 + 2 + (-3)}{3} = \frac{3}{3} = 1$$

$$k = \frac{y_1 + y_2 + y_3}{3} = \frac{3 + (-3) + 5}{3} = \frac{5}{3}$$

$$dnd \quad \left(1, \frac{5}{3} \right)$$

mÜkj 17 eku fy; k fd f=Hkqt ds dks k ($\alpha - \delta$)°, α °, ($\alpha + \delta$)° gA 14½

f=Hkqt ds rhuka dks kka dh eki 180° gA

$$\Rightarrow (\alpha - \delta)^\circ + \alpha^\circ + (\alpha + \delta)^\circ = 180^\circ \Rightarrow 3\alpha = 180^\circ \Rightarrow \alpha = 60^\circ$$

$$vr% l cl scMkt dks k 105^\circ gA \alpha + \delta = 105^\circ \Rightarrow 60^\circ + \delta = 105^\circ \Rightarrow \delta = 45^\circ$$

$$l cl sNks/k dks k (\alpha - \delta)^\circ \Rightarrow \alpha - \delta = 60^\circ - 45^\circ = 15^\circ$$

$$15^\circ = \frac{\pi}{180} \times 15 = \frac{\pi}{12}$$

$$chp dks k = 60^\circ = \frac{\pi}{180} \times 60 = \frac{\pi}{3}$$

$$l cl scMkt dks k = 105^\circ = \frac{\pi}{180} \times 105 = \frac{7\pi}{12}$$

$$vrk"V dks k \frac{\pi}{12}, \frac{\pi}{3}, oa \frac{7\pi}{12} jSM; u gA$$

14/2

ekuk f=Hkqt ds dks k $\angle A, \angle B, \angle C$ gA

$$\angle A : \angle B : \angle C = 2 : 3 : 4$$

ekuk dkboz dks k x gSrkj ge tkurs gfd $\angle A + \angle B + \angle C = 180^\circ$

$$\therefore \angle A = 2x, \angle B = 3x, \angle C = 4x$$

$$vr% 2x + 3x + 4x = 180^\circ$$

$$\Rightarrow 9x = 180^\circ$$

$$\Rightarrow x = 20^\circ$$

$$vr% \angle A = 2x = 2 \times 20^\circ = 40^\circ = 40^\circ \times \frac{\pi}{180} = \frac{2\pi}{9} jSM; u$$

$$\angle B = 3x = 3 \times 20^\circ = 60^\circ = 60^\circ \times \frac{\pi}{180} = \frac{\pi}{3} jSM; u$$

$$\angle C = 4x = 4 \times 20^\circ = 80^\circ = 80^\circ \times \frac{\pi}{180} = \frac{4\pi}{9} jSM; u$$

$$vr% f=Hkqt ds dks k 40^\circ, 60^\circ, 80^\circ gftuds jSM; u eku \varnothing e'k% \frac{2\pi}{9}, \frac{\pi}{3}, \frac{4\pi}{9} gA$$

mūkj 18 ; fn $x = a \sec \theta$ (i) RkFkk $y = b \tan \theta$ (ii) 1½

$$\begin{aligned} & \text{I eht (i) } \int \frac{x}{a} = \sec \theta \quad \text{RkFkk I eht (ii) } \int \frac{y}{b} = \tan \theta \\ &= \frac{x^2}{a^2} - \frac{y^2}{b^2} \\ &= \sec^2 \theta - \tan^2 \theta \quad \left[\begin{array}{l} \because 1 + \tan^2 \theta = \sec^2 \theta \\ 1 = \sec^2 \theta - \tan^2 \theta \end{array} \right] \\ &= 1 \end{aligned}$$

1½

; fn $x = a \cos \theta - b \sin \theta$ ----- 1½

RkFkk $y = a \sin \theta + b \cos \theta$ ----- 1½

I ehdj . k 1½ o 1½ dks oxL dj ds tkus ij

$$\begin{aligned} x^2 + y^2 &= a^2 (\cos^2 \theta + \sin^2 \theta) + b^2 (\cos^2 \theta + \sin^2 \theta) \\ &\quad - 2ab \cos \theta \sin \theta + 2ab \sin \theta \cos \theta \end{aligned}$$

$$x^2 + y^2 = a^2 + b^2 \quad \left[\because \sin^2 \theta + \cos^2 \theta = 1 \right]$$

mūkj 19 ?ku I s dkVs x; scMs I scMs' kdqdk vkl; ru V = $\frac{1}{3}\pi r^2 h$ 1½

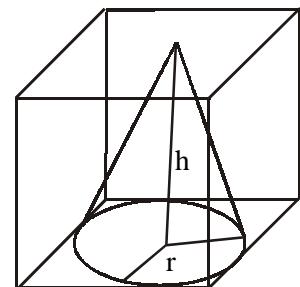
fn; k g\\$ h = 3 I eht

'kdqds vklkj dk 0; kI = 2r = 3 I eht

$$r = \frac{3}{2} \text{ I eht}$$

eku j [kus ij] V = $\frac{1}{3}\pi \left(\frac{3}{2}\right)^2 \cdot 3$

$$V = \frac{9}{4}\pi \text{ ?ku I eht} = 2.25\pi$$



1½

ekuk xsys dh f=T; k = r

fn; k g\\$ xsys dk i "Bh; {k\\$Qy = 616 oxz l seh

$$\Rightarrow 4\pi r^2 = 616 \Rightarrow 4 \times \frac{22}{7} \times r^2 = 616 \Rightarrow r^2 = \frac{7 \times 616}{4 \times 22}$$

$$\Rightarrow r^2 = 7 \times 7 \Rightarrow r = 7 \text{ l seh}$$

$$\therefore xsys dk v k; ru = \frac{4}{3}\pi r^3 = \frac{4}{3} \times \pi \times (7)^3 = \frac{4}{3} \times \pi \times 7 \times 7 \times 7$$

$$= \frac{1372}{3}\pi \text{ ?ku l seh}$$

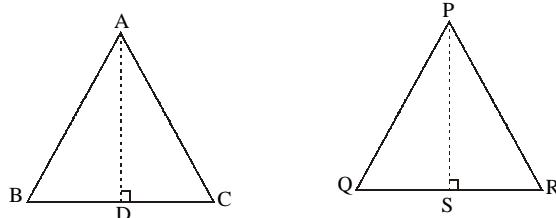
mUkj 20- i es dFku % nks l e: i f=kkQYk dk vukkRk fdluga nks LkxRk
HkTkkvka ds vkkk ds vukkRk ds cjkckj gkks ga

1/4½

Kkr g\\$% nks l e: i f=HkA ABC v k PQR

$$f) djuk g\$% \frac{\{k\$Qy \Delta ABC}{\{k\$Qy \Delta PQR} = \frac{AB^2}{PQ^2} = \frac{BC^2}{QR^2} = \frac{AC^2}{PR^2}$$

jruk % AD ⊥ BC v k PS ⊥ QR [kpkA]



mi ifyk %

dFku	dkj.k
$\frac{\{k\$Qy \Delta ABC}{\{k\$Qy \Delta PQR} = \frac{1/2 BC \times AD}{1/2 QR \times PS}$ $\frac{\{k\$Qy \Delta ABC}{\{k\$Qy \Delta PQR} = \frac{BC}{QR} \times \frac{AD}{PS} \quad \dots \text{ (i)}$ <p>VC f=HkA ADB v k PSQ e: $\angle B = \angle Q$</p>	<p>le: i Δ ds l xr dks cjkj g\\$</p>

$$\angle ADB = \angle PSQ$$

$$\Delta ADB \sim \Delta PSQ$$

$$\frac{AB}{PS} = \frac{AD}{PQ} \quad \dots(\text{ii})$$

$$\text{yfdu } \frac{AB}{PQ} = \frac{BC}{QR} \quad \dots(\text{iii})$$

$$\therefore \frac{AD}{PS} = \frac{BC}{QR} \quad \dots(\text{iv})$$

$$\frac{\{k\}Qy \Delta ABC}{\{k\}Qy \Delta PQR} = \frac{BC}{QR} \times \frac{BC}{QR} = \frac{BC^2}{QR^2}$$

b1 i dkj fl) dj l drsgfd

$$\frac{\{k\}Qy \Delta ABC}{\{k\}Qy \Delta PQR} = \frac{AB^2}{PQ^2}$$

$$\text{vks } \frac{\{k\}Qy \Delta ABC}{\{k\}Qy \Delta PQR} = \frac{AC^2}{PR^2} = \frac{AB^2}{PQ^2}$$

vFkkz~

$$\frac{\{k\}Qy \Delta ABC}{\{k\}Qy \Delta PQR} = \frac{AB^2}{PQ^2} = \frac{BC^2}{QR^2} = \frac{AC^2}{PR^2}$$

iR; d 90° dk gA yipuk l s½
AA le: irk mi es l s

le: i Δ dh l xr Hkotk; s
l ekui kfrd gksh gA

Δ ABC ~ Δ PQR

(ii) O (iii) l s

(i) O (iv) l s

bfr fl) e

1/4 Fkkz½

Fkkz lkeks & , d f=Hkot dh , d Hkot ds l ekj [khph xbZ jsk vU; nks Hkotkvksdksftu nksfcnyksij ifrPNn djrh gSosfcnqHkotkvksdks l eku vuqkr eafoHkDr djrs gA

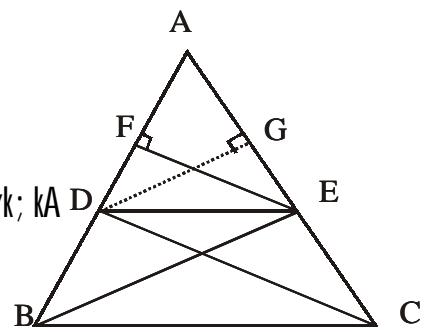
Kkr gS% Δ f=Hkot ABC ea DE||BC

$$fl) djuk gS% \frac{AD}{DB} = \frac{AE}{EC}$$

jruk % (i) B dks E l s rFkk C dks D l s feyk; kA D

(ii) EF ⊥ AB [khpkA]

(iii) DG ⊥ AE [khpkA]



miflyk %

dFku	dkj . k
$\Delta \text{dk} \{ \text{Qy} \frac{3}{4} \frac{1}{2} \text{vk/kkj} \times \text{Apkbz}$ $\frac{\Delta \text{ADE dk} \{ \text{Qy}}{\Delta \text{BDE dk} \{ \text{Qy}} = \frac{\frac{1}{2} \text{AD.EF}}{\frac{1}{2} \text{BD.EF}} = \frac{\text{AD}}{\text{BD}} \dots (\text{i})$ <p style="text-align: center;">bl h i dkj]</p> $\frac{\Delta \text{ADE dk} \{ \text{Qy}}{\Delta \text{CDE dk} \{ \text{Qy}} = \frac{\frac{1}{2} \text{AE.DG}}{\frac{1}{2} \text{EC.DG}} = \frac{\text{AE}}{\text{EC}} \dots (\text{ii})$ <p style="text-align: center;">yfdu] $\Delta \text{BDE dk} \{ \text{Qy} \frac{3}{4}$ $\Delta \text{CDE dk} \{ \text{Qy} \dots (\text{iii})$</p> $\text{vr\%} \quad \frac{\text{AD}}{\text{BD}} = \frac{\text{AE}}{\text{EC}}$	$, d \text{ gh vk/kkj vkg , d gh l ekj}$ $j \{ \text{k} \text{vka ds chp cus f=Hkq dk}$ $\{ \text{Qy cjkj gksk gA}$ <p style="text-align: center;">(i), (ii), (iii) s bfr fl) e</p>

mUkj 21- Fkks Eka xna dh dy l ; k 4 \$ 5 \$ 7 $\frac{3}{4}$ 16

$$n(S) = 16$$

(i) 7 l Qn xna eal sdkbz, d l Qn xn fudkyh tk l drh gA

$$n(A) = 7$$

$$\text{vr\% LkQn xn fudkyus dh i kf; drk} \quad P(A) = \frac{n(A)}{n(S)}$$

$$P(A) = \frac{7}{16}$$

(ii) LkQn , kk dkYkh xn fudkyus dh i kf; drk

$$P(A) = \frac{7}{16} + \frac{4}{16}$$

$$\frac{7+4}{16} \quad \frac{11}{16}$$

1/4 वर्षाकृति

द्युमितीलक्षण विवरण; $n(S) = 52$

(i) इनमें से किसी दो रुपयों का घटनाक्रम अविभागी है।

$$n(A) = 13$$

$$P(A) = \frac{n(A)}{n(S)} = \frac{13}{52} = \frac{1}{4}$$

(ii) इनमें से किसी दो रुपयों का घटनाक्रम अविभागी है।

$$n(A) = 1 + 1 = 2$$

$$P(A) = \frac{n(A)}{n(S)} = \frac{2}{52} = \frac{1}{26}$$

मूल्य 22 फैलाव गणना $x = \frac{3ab}{a+b}$ गणित में $\frac{2x+3a}{2x-3a} + \frac{2x+3b}{2x-3b} = 2$ 15%

$$\frac{x}{3a} = \frac{b}{a+b}$$

2 रुपये विभागी हैं।

$$\frac{2x}{3a} = \frac{2b}{a+b}$$

$$\frac{3b+a}{b-a} + \frac{3a+b}{-(b-a)} = 2 \quad \text{क्रमानुसार विभागी हैं।}$$

$$\frac{2x+3a}{2x-3a} = \frac{3b+a}{b-a} \quad \dots \dots \dots \quad (1)$$

रिप्रेसिप्शन

$$\frac{x}{3b} = \frac{a}{a+b}$$

2 रुपये विभागी हैं।

$$\frac{2x}{3b} = \frac{2a}{a+b}$$

$$\frac{2x+3b}{2x-3b} = \frac{2a+(a+b)}{2a-(a+b)} \quad , \quad \text{LkEkkRkj LkRk fuk, kEk Lks}$$

$$\frac{2x+3b}{2x-3b} = \frac{3a+b}{a-b} = \frac{3a+b}{-(b-a)} \quad \dots \dots \dots \quad (2)$$

LkEkhadj . k 1/1½ Rkfkk 1/2½ dks TkkMoks lkj

$$\Rightarrow \frac{2x+3a}{2x-3a} + \frac{2x+3b}{2x-3b} = \frac{3b+a}{b-a} + \frac{3a+b}{-(b-a)}$$

$$\frac{3b+a-3a-b}{b-a}$$

$$\frac{2(b-a)}{b-a}$$

$$2$$

1/4 Fkdk½

i Eke LkEkkRkj Js kh ds fy, a=1, d=1

$$S_1 = \frac{n}{2}[2 \times 1 + (n-1) \times 1]$$

$$S_1 = \frac{n}{2}[2 + n - 1]$$

$$S_1 = \frac{n}{2}[n + 1]$$

f}rh; LkEkkRkj Js kh ds fy, a=2, d=3

$$S_2 = \frac{n}{2}[2 \times 2 + (n-1) \times 3]$$

$$S_2 = \frac{n}{2}[4 + 3n - 3]$$

$$S_2 = \frac{n}{2}[3n + 1]$$

r rh; LkEkkRkj Js kh ds fy, a=3, d=5

$$S_3 = \frac{n}{2}[2 \times 3 + (n-1) \times 5]$$

$$S_3 = \frac{n}{2}[6+5n-5]$$

$$S_3 = \frac{n}{2}[5n+1]$$

i fke] f}rh; , oar rh; I ekUrj Jf.k; kdk ; kx

$$\begin{aligned} S_1 + S_2 + S_3 &= \frac{n}{2}[n+1] + \frac{n}{2}[3n+1] + \frac{n}{2}[5n+1] \\ &= \frac{n}{2}[n+1+3n+1+5n+1] \\ &= \frac{n}{2}[9n+3] \\ &= \frac{3n}{2}[3n+1] \\ &= \frac{3}{2}(3n+1)n \end{aligned}$$

mUkj 23 ?ku'; ke dh okf"kd vk; 15½

1-	ey oru l svk;	12500 × 12 ekg ¾ 1]50]000 : -
	egxkbz HkYkk l svk;	6300 × 12 ekg ¾ 75600 : -
	vr%dy okf"kd vk; ¾ 2]25]600 : -	
2-	dj e NV ; k; j kf'k	okf"kd
	½ okf"kd l kekJ; Hkfo"; fuf/k e v'knku	2000 × 12 ¾ 24]000 : -
	½ th vkbz , l okf"kd i fe; e	250 × 12 ¾ 3]000 : -
	½ okf"kd thou chek i fe; e	¾ 69]000 : -
	½ okf"kd Mkd thou chek i fe; e	¾ 10]000 : -
	dj e NV ; k; j kf'k ½ a + b + c + d½	
	24]000 \$ 3]000 \$ 69]000 \$ 10]000 ¾ 1]06]000 : -	
	i jUrqvf/kdre NV ; k; j kf'k 1]00]000 : - rd l hfer gA	
	rc dj e NV ; k; j kf'k ¾ 1]00]000 : -	

- 3- dj ; k; jkf'k 2]25]600 : - & 1]00]000 : - $\frac{3}{4}$ 1]25]600 : -

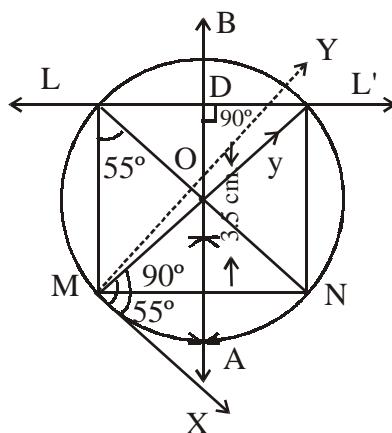
4- vk; dj $\frac{3}{4}$ 1]25]600 & 1]10]000 $\frac{1}{2}$ $\frac{3}{4}$ 1]56]000 dk 10%
 $\frac{3}{4} 15,600 \times \frac{10}{100}$ $\frac{3}{4} 1560$: -

5- f'k{k mi dj $\frac{3}{4}$ 1560 rd 3%
 $\frac{3}{4} 15,60 \times \frac{10}{100}$ $\frac{3}{4} 46-80$ $\frac{3}{4} 47$: -

6- ns dy vk; dj $\frac{3}{4}$ 1560 \$ 47 $\frac{3}{4}$ 1607 : -
 vr%?ku'; ke }kjk dy ns vk; dj $\frac{3}{4}$ 1607 : -
 $\frac{1}{4}\sqrt{Fk}(\text{kk})\frac{1}{2}$

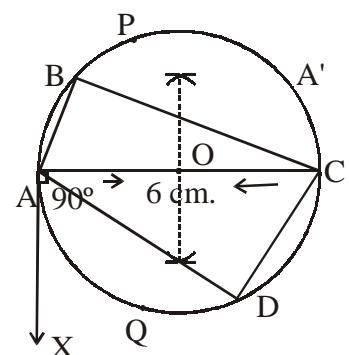
23 'kkfyuh dh okf"kd vk;
 1- dfork dh dy okf"kd vk; $\frac{3}{4}$ 1]80]000 : -
 2- dj e NV ; k; jkf'k
 $\frac{1}{4}a\frac{1}{2}$ okf"kd I keku; Hkfo"; fuf/k e v'knku $\frac{3}{4}$ 40]000 : -
 $\frac{1}{4}b\frac{1}{2}$ th vkbz , I okf"kd i hfe; e 250 x 12 $\frac{3}{4}$ 3]000 : -
 $\frac{1}{4}b\frac{1}{2}$ okf"kd thou chek i hfe; e 5000 x 2 $\frac{3}{4}$ 10]000 : -
 dj e NV ; k; jkf'k $\frac{1}{4}a + b\frac{1}{2}$ $\frac{3}{4}$ 40]000 \$ 3]000 \$ 10]000 $\frac{3}{4}$ 53]000 : -
 i jUrqvfdre NV ; k; jkf'k 1]00]000 : - rd I hfer gA
 3- dj ; k; jkf'k $\frac{3}{4}$ 1]80]000 : - & 53]000 : - $\frac{3}{4}$ 1]27]000 : -
 4- vk; dj $\frac{3}{4}$ 1]27]000 : - rd dkbl dj ughA
 vr%'kkfyuh dks dkbl dj ughansuk i MxkA

mÙkj 24



$\frac{1}{4}\pi F k O k \frac{1}{2}$

mÜkj 24



jpu k ds i n %

OKXkZ vRkj kYk	0&10	10&20	20&30	30&40	40&50
Ckkj &kkj Rkk	4	8	10	11	16
I p; h ckjcjrk	4	12	22	33	49

i nka dh I ð; k N ¾ 49

$$\text{ef/; dk } I \frac{\pi}{4}; k \quad \frac{N}{2} \quad 24.5$$

tksfd I p; h ckjcjrk 33 ds vrxr vkrk gA

ef/; dk oxz 30&40

ef/; dk oxz dh fuEu I hek ¾ 30

ef/; dk oxz dh mPp I hek ¾ 40

ef/; dk oxz dh vkofRr ¾ 11

ef/; dk oxz ds Bhd i gys dh I p; h vkofRr ¾ 22

$$\text{ef/; dk } \frac{3}{4} L_1 + \frac{(m-c)(L_2 - L_1)}{f}$$

$$\frac{3}{4} 30 + \frac{(24.5 - 22)(40 - 30)}{11} = 30 + \frac{2.5 \times 10}{11}$$

$$\frac{25}{11} = 30 + 2.27$$

ef/; dk ¾ 32.27

1/4 FkOkk½

OKXkZ	0&10	10&20	20&30	30&40	40&50	50&60	60&70
Ckkj &kkj Rkk	8	15	21	37	31	14	12

I kj .kh I sLi "V gSfd I cl s vf/kd ckj ej rk 37 gS tks oxz30&40 dh gA
vr%cg yd oxz30&40

cgyd oxz dh fuEu l hek ¾ 30

cgyd oxZ dh mPp l hek ¾ 40

$$f_1 = 37, \quad f_0 = 21, \quad f_2 = 31$$

cgyd oxl dh fuEu I hek

$$\frac{3}{4} L_1 + \frac{f_1 - f_0}{2f_1 - f_0 - f_2} (L_2 - L_1)$$

$$\frac{3}{4} \quad 30 + \frac{37 - 21}{2 \times 37 - 21 - 31} (40 - 30) = 30 + \frac{16}{74 - 52} \times 10$$

$$\frac{3}{4} \quad 30 + \frac{160}{22} = 30 + \frac{80}{11} = 30 + 7.27$$

3/4 37-27

mūkj 26 ekuk flkRkk dh oržku vč,kq x o"kl vč,j lkčk dh oržku vč,kq y o"kl g§g§ ½½
 1 o"kl i pčl fir k dh vč; q¾ (x-1) o"kl
 1 o"kl i pčl i f dh vč; q¾ (y-1) o"kl
 i t ukud kj] i Fke 'krz l §

$$(x - 1) = (y - 1).8$$

$$x - 1 = 8y - 8$$

$$x - 8y = -8 + 1$$

$$x - 8y = -7$$

f}rh; 'krz | s

$$x = y^2 \quad \dots\dots\dots(ii)$$

I eh (i) I sx dk eku j [kus ij

$$8y - 7 = y^2$$

$$\Rightarrow y^2 - 8y + 7 = 0$$

$$\Rightarrow y^2 - y - 7y + 7 = 0$$

$$\Rightarrow y(y - 1) - 7(y - 1) = 0$$

$$\Rightarrow (y - 1)(y - 7) = 0$$

$$\Rightarrow (y - 1) = 0 ; \& (y - 7) = 0 \quad \Rightarrow \quad y = 1 ; \& y = 7$$

$$\Rightarrow y = 1^2 ; \& y = 7^2 \quad \Rightarrow \quad y = \pm 1 ; \& y = \pm 7$$

D; kif firkl i f dh vk; qcjkjcj ughagksI drh vr%fir k dh vk; q49 o"klvkj
i f dh vk; q7 o"klgA

14/FlOkkV2

eku igyh le l[; k x, nljh Øekxr le l[; k (x + 2) gA

$$itukuj kj \quad x^2 + (x + 2)^2 = 164$$

$$\Rightarrow x^2 + (x^2 + 4x + 4) = 164$$

$$\Rightarrow 2x^2 + 4x + 4 = 164$$

$$\Rightarrow 2(x^2 + 2x + 2) = 164$$

$$\Rightarrow x^2 + 2x + 2 - 82 = 0$$

$$\Rightarrow x^2 + 2x - 80 = 0$$

$$\Rightarrow x^2 - 8x + 10x - 80 = 0$$

$$\Rightarrow x(x - 8) + 10(x - 8) = 0$$

$$\Rightarrow (x - 8)(x + 10) = 0$$

$$x - 8 = 0 ; \text{ } k \text{ } x + 10 = 0$$

$$x = 8 ; \text{ } k \text{ } x = -10$$

x dk eku __.kkRed ugha gks l drk] vr% x = 8

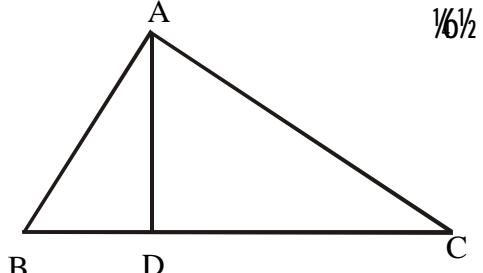
∴ n̄l j̄l d̄kxr | {; k, ags(x + 2) = 8 + 2 = 10
vr% v̄k̄h"V | {; k, j 8, 10 ḡk̄hA

mÙkj 27 fn; k gs % LkEkCkkgq f«kHkT k Δ ABC gA

f)) djuk gS: $3BC^2 = 4AD^2$

mi ifr % ΔABC es $AB = BC = AC$

$\nabla \text{if } AD \perp BC, BD = CD = \frac{BC}{2}$



16½

I edks k f~~k~~k~~k~~~~k~~ Δ ABD ea i kbFkkxkj I i es I s

$$\Rightarrow AB^2 = AD^2 + BD^2$$

$$\Rightarrow AB^2 = AD^2 + \left(\frac{BC}{2} \right)^2$$

$$\Rightarrow AB^2 = AD^2 + \frac{BC^2}{4}$$

$$\Rightarrow BC^2 = AD^2 + \frac{BC^2}{4} \quad (\because AB = BC)$$

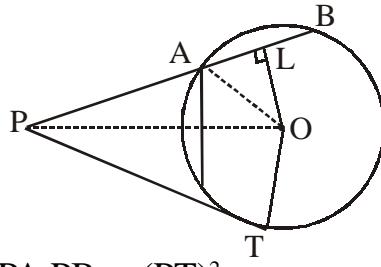
$$\Rightarrow BC^2 - \frac{BC^2}{4} = AD^2$$

$$\Rightarrow 4BC^2 - BC^2 = 4AD^2$$

$$\Rightarrow 3BC^2 = 4AD^2 \quad \text{fl) gvkA}$$

1/4 Fkokk 1/2

mÜkj 27 fn; k g§ C(O, r) g§ PAB Nnd js[kk rFkk PT Li 'kz js[kk g§



$$\text{f1) djuk g\$ \% PA.PB} = (PT)^2$$

jpu\\$ \% OL \perp AB [\text{hpk A OA, OP vkg OT dksfeyk; k}

$$\text{mi i fRr \% PA.PB} = (PL - AL)(PL + LB)$$

$$= (PL - AL)(PL + AL) \quad (\because AL = LB)$$

$$= PL^2 - AL^2$$

$$= (OP^2 - OL^2) AL^2$$

$$\therefore \text{ledksk } \Delta PLO \text{ ei } OP^2 = OL^2 - PL^2.$$

$$= OP^2 - OL^2 - AL^2$$

$$= OP^2 - (OL^2 + AL^2)$$

$$= OP^2 - OA^2$$

$$\therefore \text{ledksk } \Delta ALO \text{ ei } OA^2 = OL^2 - AL^2.$$

$$= OP^2 - OT^2$$

$$= PT^2$$

$$\therefore \text{ledksk } \Delta PTO \text{ ei } OP^2 = PT^2 - OP^2.$$

$$PA.PB = PT^2$$

Set - B

gkbz Ldy | fMQdV ijhkk

High School Certificate Examination

| fiy&itu i=

SAMPLE PAPER

fo'k; % (Subject) - xf.kr (Mathematics)

le; 3 ?k.VK (Time- 3 Hrs)

d{kk % (Class) - nI oh (X)

iWd 100 (M.M.)

(Instruction) & Vunzh

- 1- **I hh itu gy djuk vfuok; ZgSA**

Attempt all the Question

- 2- **itu Øekd 01 e 10 vd fu/kkjrh gSA nks dky [k.M gSA [k.M ^v** e 05
cgjodYih; itu rFkk [k.M ^c** e 05 fjDr LFkkuk dh i firz vFkok mfpr
I cak tkSM, A iR; d itu dsfy, 1 vd vkcfVr gSA**

Q. No. 01 Carries 10 Marks. There are two sub-section, Section A is Multiple choice carries 05 marks and section B is fill in the blanks or match the column carries 05 marks.

- 3- **itu Øekd 02 l situ Øekd 09 rd vfr y?kmRrjh; itu gSA iR; d itu
ij 02 vd vkcfVr gSA mRrj dh vf/kdre 'kCn I hek 30 'kCn A**

Q. No. 2 to 09 are very short answer type question & it carries 02 marks each. Word limit is maximum 30.

- 4- **itu Øekd 10 l situ Øekd 15 rd y?kmRrjh; itu gSA iR; d itu ij 03
vd vkcfVr gSA mRrj dh vf/kdre 'kCn I hek 50 'kCn A**

Q. No. 10 to 15 are short answer type question & it carries 03 marks each. Word limit is maximum 50.

- 5- **itu Øekd 16 l situ Øekd 21 rd y?kmRrjh; itu gSA iR; d itu ei
vkrfjd fodYi gSvkj iR; d itu ij 04 vd vkcfVr gSA mRrj dh vf/kdre
'kCn I hek 75 'kCn A**

Q. No. 16 to 21 are short answer type question & it carries 04 marks each. Each question has internal choice. Word limit is maximum 75.

6- itu Øekd 22 ls itu Øekd 25 rd nh?kñRrjh; itu gSA iR; d itu e
vkrfjd fodYi gSvkj iR; d itu ij 05 vd vkcVr gSA mRrj dh vf/kdre
'kCn l hek 100 'kCn A

Q. No. 22 to 25 are long answer type question & it carries 05 marks each. Each question has internal choice. Word limit is maximum 100.

7- itu Øekd 26 ls itu Øekd 27 rd nh?kñRrjh; itu gSA iR; d itu e
vkrfjd fodYi gSvkj iR; d itu ij 06 vd vkcVr gSA mRrj dh vf/kdre
'kCn l hek 150 'kCn A

Q. No. 26 to 27 are long answer type question & it carries 06 marks each. Each question has internal choice. Word limit is maximum 150.

it u 1 ½ l gh fodYi pfu, %

- (i) 5 vks 10 dk RkRkh,k vUkkRkh gkxkk & 1½
(a) 15 (b) 20 (c) 25 (d) 30
- (ii) $\frac{\pi}{3}$ dk vdk Eka EkkIk gkxkk & 1½
(a) 45° (b) 60° (c) 75° (d) 120°
- (iii) PkOhk Pkrkh,k ds LkEEkd,k dks kka dk ,kxk gkxkk g& 1½
(a) 90° (b) 120° (c) 180° (d) 360°
- (iv) 0.125 dk f}vk/kkj h lkz kkYkh Eka EkkUk gkxkk & 1½
(a) 0.01 (b) 0.101 (c) 0.001 (d) 0.111
- (v) vcl 7]8]8]7]9]8]10] dk CkgVkd gkxkk & 1½
(a) 7 (b) 8 (c) 9 (d) 10

Que 1 (A) Choose the correct answer -

- (i) Third proportional of 5 and 10 is -
(a) 15 (b) 20 (c) 25 (d) 30
- (ii) Value of $\frac{\pi}{3}$ in degree -
(a) 45° (b) 60° (c) 75° (d) 120°
- (iii) Sum of opposite angle of cyclic quadrilateral is -
(a) 90° (b) 120° (c) 180° (d) 360°
- (iv) Value of 0.125 in Binary number is -
(a) 0.01 (b) 0.101 (c) 0.001 (d) 0.111

(v) Mode of 7, 8, 8, 7, 9, 8 and 10 is -

½ c ½ fj DRk LFkkUkka dh lkFRkZ dhfTk k&

- (i) 1] 4]7] 10 dk lk nk lk j &&&& g A 1½

(ii) f ck nq ¼] 0%&&&&&& v {k lk j f LF k R k g k x k A 1½

(iii) tan(90 - θ) &&&&&&&&&& g k R k k g A 1½

(iv) ? k U k k H k E k &&&& Q Y k d g k R k s g A 1½

(v) 4 E k h- H k q T k k O k k Y k s O k k Z d s f o k d . k Z d h Y k E C k k b Z &&&&& g k x k h A 1½

(B) Fill in the blanks:

- (i) Common difference of 1, 4, 7, 10, is
 - (ii) Co-ordinate (4, 0) lies on axis.
 - (iii) Value of $\tan(90 - \theta)$ is
 - (iv) Number of surface in cuboid is
 - (v) Length of diagonal of square is whose side is 4 cm.

$$\text{İkinci Ük } 2 \quad \text{İkinci Eksik } 0, \text{karakter } \frac{x+1}{x-2} \text{ Rükükk } \frac{x-1}{x-2} \text{ dikk vüdkj Kükük dhftük, ksk } \quad 12/2$$

Find the different between $\frac{x+1}{x-2}$ and $\frac{x-1}{x-2}$.

$$1 \text{ k}z \text{ U}k \ 3 \quad \text{okXkZ LkEkhdj .k } 3x^2 - 5x + 2 \equiv 0 \quad \text{ds EkVk KkRk dhfTk ,k} \quad 12\frac{1}{2}$$

Find the roots of $3x^2 - 5x + 2 = 0$

lkz lk 4 $\frac{\sin 15^\circ}{\cos 75^\circ}$ dk Ekkuk Kkrk dhftks \ 12½

Find the value of $\frac{\sin 15^\circ}{\cos 75^\circ}$

Ques 5 Find the distance between (-3, 4) and (2, 3). 1½

Find the distance between (-3, 4) and (2, 3).

Ques 6 Find the curved surface area of cylinder whose height is 20 cm. and radius is 7.8 cm. 1½

Find the curved surface area of cylinder whose height is 20 cm. and radius is 7.8 cm.

Ques 7 In $\triangle ABC$, AB = 8 cm., AP = 4 cm., AQ = 3 cm. and AC = 9 cm. then show that PQ||BC or not. 1½

In $\triangle ABC$, AB = 8 cm., AP = 4 cm., AQ = 3 cm. and AC = 9 cm. then show that PQ||BC or not.

Ques 8 Write four characteristics of algorithm. 1½

Write four characteristics of algorithm.

Ques 9 Find the sum of two binary numbers 110011 and 011101. 1½

Find the sum of two binary numbers 110011 and 011101.

Ques 10 Two numbers are in the ratio 3 : 4, if 8 is subtracted from each of them they become in the new ratio 2 : 3. Find the numbers. 1½

Two numbers are in the ratio 3 : 4, if 8 is subtracted from each of them they become in the new ratio 2 : 3. Find the numbers.

Ques 11 Construct the quadratic equation whose roots are $3 + \sqrt{3}$ and $3 - \sqrt{3}$. 1½

Construct the quadratic equation whose roots are $3 + \sqrt{3}$ and $3 - \sqrt{3}$.

Ikz Uz 12 ,kfn Lka[,kk,ka a, b, c fokRkrkuklkkRk Eka gks Rkks fLk) dhfTk,ks fd& 13½

If a, b, and c are in continued proportional then prove that

$$\frac{a^2 + ab + b^2}{b^2 + bc + c^2} = \frac{a}{c}.$$

Ikz Uz 13 EkksgUk Uks Ñf"k fokdkLk ck& Lks 50]000 : -] 2 ok"kz ds fYk,ks Lkkokf/k TkEkk fd, kKA ,kfn C,kkTk dh nj 10 lkfRk'kRk okf"kz gks RkFkk C,kkTk lkfRk N%kkgh LkakksTkRk gkRkk gS Rkks lkfj lkDokRkk lkj ck& mLks fTkRkukk /kUk nkkA KkRk dhfTk,ks \ 13½

Mohan deposit Rs. 50000 in Krishi Vikas Bank for 2 year in fixed deposite account. If the rate of interest is 10% p.a., then calculate the maturity amount if the interest is compounded half yearly.

Ikz Uz 14 fLk) dhfTk,ks $\tan^2 \theta - \sin^2 \theta = \tan^2 \theta \cdot \sin^2 \theta$ 13½

Prove that $\tan^2 \theta - \sin^2 \theta = \tan^2 \theta \cdot \sin^2 \theta$

Ikz Uz 15 nks XkkYkka ds vkk,krkukka dk vUkdkRk 1% gS Rkks mUkdh fka dk vUkdkRk KkRk dhfTk,ks \ 13½

The ratio of volume of two sphere is 1 : 8 then find the ratio of their radius.

Ikz Uz 16 a ds fdLk EkkUk ds fYk, fcknq 1/1]4½ 1/a, &2½ vks 1/3]16½ Lkejs[k gkk& 14½

For what value of a , the point $(1, 4)$, $(a - 2)$ and $(-3, 16)$ will be colliner.

1/4Fkok½ (OR)

mLk fdk dñed KkRk dhfTk, fTkLkds 'kh"kk ds fuknkk 1/4] 3½ 1/2] &3½ 1/3] 5½ gA

Find the centroid of a triangle whose vertices are $(4, 3)$, $(2, -3)$ and $(-3, 5)$.

I₁Q₁ 17 fDLkh f₂kHk₂Tk ds dks k L₂EkkRkj J₂s kh Eka gS LkCkLks CkMs dks k dk EkkUk 105° gS RkhUkka dks kka ds EkkUk dk jSM₂ku Eka KkRk dhfTk, A 1½

The angles of a triangle are in A.P. The biggest angle is 105°. Find the angles in radian.

1½ (OR)

, d f₂kHk₂Tk ds dks k 28% Eka gS A f₂kHk₂Tk ds dks kka ds EkkIk jSM₂ku Eka KkRk dhfTk, A

The angles of a triangle are in the ratio 2 : 3 : 4. Find the measures of angles in radian.

I₁Q₁ 18 $x = a \sec \theta$ Rkfkk $y = b \tan \theta$ gks Rkks fLk) dhfTk, fd $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$. 1½

If $x = a \sec \theta$ and $y = b \tan \theta$ then prove that : $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$

1½ (OR)

kfn $x = a \cos \theta - b \sin \theta$ Rkfkk $y = a \sin \theta + b \cos \theta$ gks Rkks fLk) dhfTk, fd $x^2 + y^2 = a^2 + b^2$.

If $x = a \cos \theta - b \sin \theta$ and $y = a \sin \theta + b \cos \theta$ then prove that : $x^2 + y^2 = a^2 + b^2$.

I₁Q₁ 19 m₂Lk CkMs Lks CkMs 'k₂dq dk v₂,krkuk KkRk dhfTk, Tkks mLk ?ku Eka Lks dkVk Xk, kk gS fTkLkdhi dksj YkakkbZ 3 LksEkh- gA 1½

Find the volume of the greatest cone which can be cut from a cube whose edge is 3 cm.

1½ (OR)

fDLkh XkkYks dk lk" Bh,k {k&kQYk 616 okXkZ LkEkh- gks Rkks XkkYks dk v₂,krkuk KkRk

dhfTk, A

The curved surface of sphere is 616 cm^2 then find the volume of sphere.

Ikz Uk 20- nks LkkEKKU,k f«kHkqTkka ds {k&kQYk dk vUkRkRk fdUgha nks LkRkRk HkqTkkvka ds OkXkk ds vUkRkRk ds ckjckj gkks gA 14½

Prove that the ratio of the areas of two similar triangles is equal to the ratio of the squares of any two corresponding sides.

1/4Fkokk½ (OR)

Fkylk lkEksh fYkf[k, , okafLk) dhfTk, A

State and prove that Thales theorem.

Ikz Uk 21- , d FkYks Eka 4 dkYkh] 5 YkkYk] RkFkk 7 LkQn Xkn gA , kfn , d Xkn , kknPN,kk fukalkYkh Tk,kk Rkks bLkdh lkf,kdRkk D,kk gkYkh fd fukalkYkh XkbZ Xkn & (i) LkQn gkYkh (ii) LkQn ,kk dkYkh A

A bag contains 6 black, 5 red and 7 white balls. If one ball is drawn at random. What is probability that the ball drawn will be - (i) White, (ii) White or black.

1/4Fkokk½ (OR)

vPNh lkdkj Lks Qvh XkbZ52 Rkk'kkad , d XkMMh EkaLks , d Rkk'k ,kknPN,kk [khRkk TkRkk gS Rkks fukEUk dh lkf,kdRkk KkRk dhfTk, A

(i) , d iku dk rk'k gA (ii) iku ; k bW dk , Ddk gA

From a well shuffled pack of 52 cards, one card drawn at random. Find the probability of the following -

- (i) One card is of heart
- (ii) Ace of heart or diamond.

Ikz Uk 22 , kfn $x = \frac{3ab}{a+b}$ gks Rkks fLk) dhfTk, fd $\frac{2x+3a}{2x-3a} + \frac{2x+3b}{2x-3b} = 2$. 15½

If $x = \frac{3ab}{a+b}$, then prove that $\frac{2x+3a}{2x-3a} + \frac{2x+3b}{2x-3b} = 2$

Ans (OR)

Rkhuk LkEkkukkjk Jf.k, kka ds n lknka dk ,kkQYk ØEk'k% S₁, S₂, S₃ gA fTkukds IkkEk Ek lkn 1] 2] 3 RkFkk Lkkokjk ØEk'k% 1] 3] 5 gA Rkks fLk) dhfTk, fd & If S₁, S₂, S₃ be the sum of n terms of three A.P. and their first terms are 1, 2, 3 respectively and common difference are 1, 3, 5, then prove that

$$S_1 + S_2 + S_3 = \frac{3}{2}(3n+1)n$$
 15½

Ikz Uk 23 ?uk' ,kkEk dk Ekwk okRkuk lkfrkekkg 12500 : lk,ks gA RkFkk EkgkkbZHkuk lkfrkekkg 6300 : lk,ks lkkrk djRkk gSA ,kfn og LkEkkuk,k Hkfok",k fulf/k Eka lkfrkekkg 2000 : -] th vkbZ, l - ea lkfrkekkg 250 : - RkFkk HkjRkh,k Tkholuk ckhekk lkfrEk,kEk Eka lkfrkok"KZ 69000 : - ,oa Mkd?kj Tkholuk ckhekk lkfrEk,kEk lkfrkok"KZ 10000 : - TkEkk djRkk gSA mlkds }jkj nsk dñk vkkdjj KkRk dhfTk, A 15½

Basic salary of Ghanshyam is Rs 12500 per month and D.A. is Rs. 6300 per month. He invests Rs. 2000 per month in G.P.F., Rs. 250 per month is G.I.S. and Rs. 69000 yearly as annual premium to L.I.C. and also Rs. 10000 yearly in post office L.I.C. premium. Calculate the income tax paid by him?

Rate of income tax :

upto Rs. 1,10,000	nil
From Rs. 1,10,001 to 1,50,000	10%
From Rs. 1,50,001 to 2,50,000	20%
above Rs. 2,50,000	30%

Educational cess : 3% of the total payable income tax and surcharge.

1/4 Fokalk½

'kkfYkUkh dh okkf"kd v{k,k 1Ekdruk fdjk,kk HkRRkk NkMdj½ 1]80]000 : lk,ks gA ,kfn okg LkkEkkU,k Hkfok",k fukf/k Eka lkfrkok"kd 40000 : lk,k\$ LkEkg Tkhokuk CkhEkk ,kkSTkUkk Eka 250 : lk,ks lkfrEkkkg Rkfkk 5000 v) lakkf"kd Tkhokuk CkhEkk lkkfYkI h Eka fd'Rk TkEkk djRkh gA KkRk dhfTk, fd 'kkfYkUkh dks vIkUks v{k,kd j mLk fokUkh,k ok"kd fdRkUkk v{k,kd j nkk gkkka

The annual income of Mrs. Shalini (Excluding HRA) is Rs. 180000. If she deposite Rs. 40000 per year in G.P.F., Rs. 250 per month in G.I.S. and Rs. 5000 half yearly premium towards L.I.C. Calculate her income tax payable in the financial year.

Rate of income tax :

upto Rs. 1,10,000	nil
From Rs. 1,10,001 to 1,50,000	10%
From Rs. 1,50,001 to 2,50,000	20%
above Rs. 2,50,000	30%

Educational cess : 3% of the total payable income tax and surcharge.

Ikz Ukk 24 f~~kk~~Hk~~kk~~Tk ΔLMN dh jPkUkk dhfTk, Tkgk MN = 5 LksEkh] $\angle L = \angle 55^\circ$ v{k,j L Lks Mkykk Xk,kk 'kh"kd Yk&k 3-5 LksEkh- gkA jPkUkk ds lkn Hkh fYkf[k, A

Contruct ΔLMN in which $MN = 5$ cm., $\angle L = 55^\circ$ and perpendicular for L is 3.5 cm. Write steps of construction.

1/4 Fokalk½ (OR)

, d PkOhk,k Pkrk~~kk~~Tk ABCD dh jPkUkk dhfTk, fTkLkEka $\angle ABC = 90^\circ$ v{k,k AC ¾ 6 LksEkh-] AB ¾ 3 LksEkh] CD ¾ 3-6 LksEkh- jPkUkk ds lkn Hkh fYkf[k,kA

Construct a cyclic quadrilateral $ABCD$ in which $\angle ABC = 90^\circ$, $AC \frac{3}{4} 6$ cm., $AB \frac{3}{4} 3$ cm., $CD \frac{3}{4} 3.6$ cm. Write steps of construction.

Ikz Uk 25- fukEuk Lkkj .kh Lks Ekkf/ ,kdk Kkrk dhfTk, &

15½

OKKZ VRKj KYk	0&10	10&20	20&30	30&40	40&50
Ckkj @kkj Rkk	4	8	10	11	16

Find the medium of the following table :

Class	0–10	10–20	20–30	30–40	40–50
Frequency	4	8	10	11	16

$\frac{1}{4}\sqrt{Fk0k\frac{1}{2}}$ (OR)

fukEuk vkdfcr cl/u Lks cgyd KkRk dhfTk, &

OKXKZ	0&10	10&20	20&30	30&40	40&50	50&60	60&70
CKKJ @KKJ RKK	8	15	21	37	31	14	12

Find the mode of the following table :

Class	0–10	10–20	20–30	30–40	40–50	50–60	60–70
Frequency	8	15	21	37	31	14	12

Ikt Uk 26 , d Ok"Kz lkqz flkrkk dh vk,kq lkqk dh vk,kq ds 8 Xktkh Fkh vkTk flkrkk dh vk,kq lkqk
dh vk,kq ds okxz ds ckjckj gA Rkks mukdh okRkEkkuk vk,kq Kkrk dh ftTk, \ 16½

One year ago, a man was 8 times as old as his son. Now his age is equal to the square of his son's age. Find their present ages.

$\sqrt{\text{Fk0kk}} \frac{1}{2}$ (OR)

The sum of squares of two consecutive even numbers is 164. Find the numbers.

lkz lk 27 fLk) dLkf, fd fdLkh LkEkCkkqg f«kLkTlk dh fdLkh LkTkk ds OkxkZ ds frkxkdkk mLkdh

ÅPkkbZ ds okXkZ ds Pkkj Xkbks ds Okjkckj gkRkk gA

16½

Prove that three times the square of any side of an equilateral triangle is equal to four times the square of the altitude.

1/4Fkokk½ (OR)

jkfn PAB okUk dh Nnd jskk gks Tkks okUk dks A vks B lkj lkfRkPNn djRkh gS vks PT , d Llk'kL jskk [k.M gks Rkks fLk) dhfTk, PA.PB = (PT)²

If PAB is a secant to a circle which intersecting the circle at A and B and PT is a tangent segment, then show that : $PA.PB = (PT)^2$

EkkMYk mÙkj | V&ch

IkzUk 1½ Lkgh fokdYlk mÙkj

(i) 20

(ii) 60^0

(iii) 180^0

(iv) 0.001

(v) 8

½ fjDRk LFkkUka ch lkRkZ chfTk,kA

(i) 3]

(ii) $x - \sqrt{k}$

(iii) $\cot \theta$

(iv) 6 QYkd

(v) $4\sqrt{2}$ Ekh

$$mÙkj 2- \frac{x+1}{x-2} - \frac{x-1}{x-2} \quad 1½$$

$$= \frac{(x+1)-(x-1)}{(x-2)}$$

$$= \frac{x+1-x+1}{x-2}$$

$$= \frac{2}{x-2}$$

$$mÙkj 3- 3x^2 - 5x + 2 = 0 \quad 1½$$

$$3x^2 - 3x - 2x + 2 = 0$$

$$(3x^2 - 3x) - (2x - 2) = 0$$

$$3x(x-1) - 2(x-1) = 0$$

$$(3x-2)(x-1) = 0$$

$$; \text{ if } (3x-2)=0 ; \text{ if } (x-1)=0$$

$$x = \frac{2}{3} ; \text{ if } x = 1$$

$$\text{value of } \frac{2}{3} \text{ is}$$

$$\begin{aligned}
 \text{Mark 4} & \quad \frac{\sin 15^\circ}{\cos 75^\circ} & & \text{1/2} \\
 & = \frac{\sin(90^\circ - 75^\circ)}{\cos 75^\circ} \\
 & = \frac{\cos 75^\circ}{\cos 75^\circ} \\
 & = 1
 \end{aligned}$$

$$\begin{aligned}
 \text{Mark 5-} & \quad \text{function } f(x_1, y_1) \text{ and } f(x_2, y_2) \text{ such that} & & \text{1/2} \\
 & = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \\
 & = \sqrt{(2 - (-3))^2 + (3 - 4)^2} \\
 & = \sqrt{(2 + 3)^2 + (-1)^2} \\
 & = \sqrt{5^2 + 1} \\
 & = \sqrt{25 + 1} \\
 & = \sqrt{26}
 \end{aligned}$$

$$\begin{aligned}
 \text{Mark 6} & \quad \text{if } h^{3/4} = 20 \text{ then } h = 20^{4/3} \\
 & \quad \text{if } r^{3/4} = 7 \text{ then } r = 7^{4/3} \\
 & \quad \text{if } c^{3/4} = \sqrt{26} \text{ then } c = 26^{4/3}
 \end{aligned}$$

$$\begin{aligned}
 \text{圆柱的体积} &= 2\pi r h \\
 &= 2 \times \frac{22}{7} \times 7 \times 20 \\
 &= 44 \times 20 \\
 &= 880 \text{ 立方厘米}
 \end{aligned}$$

mÙkj 7

ΔABC es

$$AB = 8 \text{ l s}^{-1}$$

$$AP = 4 \text{ l sek}$$

$$AQ = 3 \text{ l s}^{-1}$$

$$AC = 9 \text{ l sek}$$

$$\frac{AQ}{AC} = \frac{3}{9} = \frac{1}{3} \quad \dots\dots\dots \text{(ii)}$$

1/2½

I eh (i) vks (ii) IsLi "V gsfds $\frac{AP}{AB} \neq \frac{AQ}{AC}$

$$\therefore PQ \neq BC$$

mÙkj 8

vYxkfjFe dh fo'kkskrk, a

12½

1½ i fjerrk

1½ fuf' prrk

$\frac{1}{4} \text{ or } \frac{1}{2}$ fuosk

$\frac{1}{4}\frac{1}{2}$ i h̥kko' khyrk

mÙkj 9-

110011

12½

\$	0	1	1	1	0	1
—————						
1	0	1	0	0	0	0

mÜkj 10	<p>ekuk q; k, a 3x 0 4x gs & iR; d e8 ?kvkus ij vuqkr 2 %3 gks tkrk gs vFkk] $3x - 8 : 4x - 8 = 2 : 3$</p> <p>; k $\frac{3x - 8}{4x - 8} = \frac{2}{3}$; k $3(3x - 8) = 2(4x - 8)$; k $9x - 24 = 8x - 16$; k $9x - 8x = -16 + 24$; k $x = 8$ vr% q; k $3x = 3 \times 8 = 24$ o $4x = 4 \times 8 = 32$ vr% q; k 24 o 32 gks h</p>	13½
mÜkj 11	<p>oxl ehadj. k ds ey α, β gks rks</p> <p>oxl ehadj. k $x^2 - (\alpha + \beta)x + \alpha\beta = 0$</p> <p>itukuj kj $\alpha = 3 + \sqrt{3}$ $\beta = 3 - \sqrt{3}$</p> <p>$\therefore \alpha + \beta = (3 + \sqrt{3}) + (3 - \sqrt{3})$ $= 6$</p> <p>$\alpha \beta = (3 + \sqrt{3})(3 - \sqrt{3})$ $= 9 - 3$ $\therefore (a + b)(a - b) = a^2 - b^2$</p> <p>$= 6$</p> <p>vr% oxl ehadj. k</p> $x^2 - 6x + 6 = 0$	13½

મંજુલી 12

a, b, c ફર્રકૃતિ એસ્

૧૩૧૨

$$\text{એકુક} \quad \frac{a}{b} = \frac{b}{c} = k$$

$$\Rightarrow \quad b = ck \quad \dots\dots \text{(i)}$$

$$; \quad a = bk = (ck)k = ck^2 \quad \dots\dots \text{(ii)}$$

$$\begin{aligned} \text{L.H.S.} &= \frac{a^2 + ab + b^2}{b^2 + bc + c^2} \\ &= \frac{(ck^2)^2 + ck^2 \cdot ck + (ck)^2}{(ck)^2 + ck \cdot c + c^2} \quad | \text{ એટ } \text{(i) \& (ii) } | \text{s} \\ &= \frac{c^2 k^4 + c^2 k^3 + c^2 k^2}{c^2 k^2 + c^2 k + c^2} \\ &= \frac{c^2 k^2 (k^2 + k + 1)}{c^2 (k^2 + k + 1)} = k^2 \quad \dots\dots \text{(iii)} \end{aligned}$$

$$\begin{aligned} \text{R.H.S.} &= \frac{a}{c} = \frac{ck^2}{c} \quad | \text{ એટ } \text{(ii) } | \text{s} \\ &= k^2 \quad \dots\dots \text{(iv)} \end{aligned}$$

| એટ (iii) રફ્ફા (iv) | s

L.H.S. = R.H.S.

મંજુલી 13

ફન્ડ ગ્રાવિયલુ p = 50000 : લક્ષ

૧૩૧૨

C; ક્રત દહન્ય r = 10 ઇફ્રીક્ર ઓફ્ફલાન્ડ ૩/૪ ૫ ઇફ્રીક્ર નેક્ઝા ; ક્રવ્ય) બ્લેફ્ફલાન્ડ
| e; n = ૨ ઓફ્ફલાન્ડ ૩/૪ ૪ નેક્ઝા

$$\text{ફેઝ/લુ} \quad A = P \left[1 + \frac{r}{100} \right]^n \quad | \text{s}$$

$$= 50000 \left[1 + \frac{5}{100} \right]^4 = 50000 \left[1 + \frac{1}{20} \right]^4$$

$$= 50000 \left[\frac{21}{20} \right]^4$$

$$= 50000 \times \frac{21}{20} \times \frac{21}{20} \times \frac{21}{20} \times \frac{21}{20}$$

$$= 60775.31 : -$$

bl i dkj ekgu dks nks o"kl i 'pkr 60775-31 : - i klr gkxka

mUkj 14 L.H.S. = $\tan^2 \theta - \sin^2 \theta$ 13½

$$= \frac{\sin^2 \theta}{\cos^2 \theta} - \sin^2 \theta$$

$$= \frac{\sin^2 \theta - \sin^2 \theta \cos^2 \theta}{\cos^2 \theta}$$

$$= \frac{\sin^2 \theta (1 - \cos^2 \theta)}{\cos^2 \theta}$$

$$= \frac{\sin^2 \theta \sin^2 \theta}{\cos^2 \theta}$$

$$= \frac{\sin^2 \theta}{\cos^2 \theta} \sin^2 \theta$$

$$= \tan^2 \theta \cdot \sin^2 \theta \quad \text{R.H.S.}$$

mUkj 15 ekuk nks xkys dh f=T; k; a o vkl; ru Øe'lk% 13½

r_1, v_1 0 r_2, v_2 gA

$$v_1 : v_2 = 1 : 8, \quad r_1 : r_2 = 3$$

$$\frac{v_1}{v_2} = \frac{1}{8}$$

$$\frac{\frac{4}{3}\pi r_1^3}{\frac{4}{3}\pi r_2^3} = \frac{1}{8} \quad \because v = \frac{4}{3}\pi r^3$$

$$\Rightarrow \frac{r_1^3}{r_2^3} = \frac{1}{8} \Rightarrow \left(\frac{r_1}{r_2}\right)^3 = \frac{1}{8}$$

$$\Rightarrow \left(\frac{r_1}{r_2}\right)^3 = \left(\frac{1}{2}\right)^3$$

$$\Rightarrow \frac{r_1}{r_2} = \frac{1}{2} \Rightarrow r_1 : r_2 = 1 : 2$$

वर्तमान फैट; व्यक्ति का 1/2 दर व्युत्कर्ष ग्राहक

मुल्क 16 इन सभी जीवन में $(x_1, y_1), (x_2, y_2) \text{ व } (x_3, y_3)$

इनके ग्राहक दर इसके

$$x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2) = 0$$

वर्तमान 4/4 वा 2/4 व्यक्ति 1/3] 16/2 इनके ग्राहक; फैट

$$\begin{aligned} &\Rightarrow 1[(-2 - 16) + \{a(16 - 4) + (-3)\}(4 - (-2)) = 0 \\ &\Rightarrow -18 + a(12) - 3(4 + 2) = 0 \\ &\Rightarrow -18 + 12a - 18 = 0 \\ &\Rightarrow 12a - 36 = 0 \\ &\Rightarrow a = 3 \end{aligned}$$

वर्तमान 1/2

मुल्क 16 ABC, दिए गए बिंदुओं के निम्नलिखित अवस्थाएँ हैं: $(x_1, y_1) = (4, 3), (x_2, y_2) = (2, -3), (x_3, y_3) = (-3, 5)$,

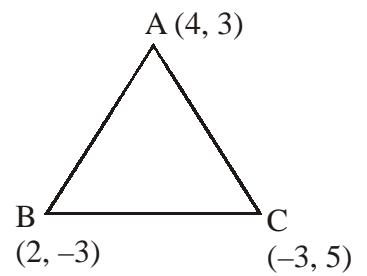
$$\text{ग्राहक दर } (h, k) = \left(\frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3} \right)$$

$$h = \frac{x_1 + x_2 + x_3}{3} = \frac{4 + 2 + (-3)}{3} = \frac{3}{3} = 1$$

$$k = \frac{y_1 + y_2 + y_3}{3} = \frac{3 + (-3) + 5}{3} = \frac{5}{3}$$

$$k = \frac{3 - 3 + 5}{3} = \frac{5}{3}$$

दिए गए $\left(1, \frac{5}{3}\right)$ ग्राहक



mÜkj 17 eku fy; k fd f=Hkqt ds dks k ($\alpha - \delta$)°, α °, ($\alpha + \delta$)° gA

14½

f=Hkqt ds rhuka dks kka dh eki 180° gA

$$\Rightarrow (\alpha - \delta)^\circ + \alpha^\circ + (\alpha + \delta)^\circ = 180^\circ \Rightarrow 3\alpha = 180^\circ \Rightarrow \alpha = 60^\circ$$

$$vr% l cl scMkt dks k 105^\circ gA \quad \alpha + \delta = 105^\circ \Rightarrow 60^\circ + \delta = 105^\circ \Rightarrow \delta = 45^\circ$$

$$l cl sNks/k dks k (\alpha - \delta)^\circ \Rightarrow \alpha - \delta = 60^\circ - 45^\circ = 15^\circ$$

$$15^\circ = \frac{\pi}{180} \times 15 = \frac{\pi}{12} jSM; u$$

$$chp dks k \alpha = 60^\circ = \frac{\pi}{180} \times 60 = \frac{\pi}{3} jSM; u$$

$$l cl scMkt dks k \alpha + \delta = 105^\circ = \frac{\pi}{180} \times 105 = \frac{7\pi}{12} jSM; u$$

$$f=Hkqt ds vHkh"V dks k \frac{\pi}{12}, \frac{\pi}{3}, \text{ or } \frac{7\pi}{12} jSM; u \text{ gkxkA}$$

14/FkOKk½

ekuk f=Hkqt ABC ds dks k $\angle A$, $\angle B$ o $\angle C$ gA

$$\angle A : \angle B : \angle C = 2 : 3 : 4$$

ekuk dkbo dks k x gSrkj ge tkurs gfd $\angle A + \angle B + \angle C = 180^\circ$

$$\therefore \angle A = 2x, \angle B = 3x \quad vLj \quad \angle C = 4x$$

$$vr% \quad 2x + 3x + 4x = 180^\circ$$

$$\Rightarrow 9x = 180^\circ$$

$$\Rightarrow x = 20^\circ$$

$$vr% \quad \angle A = 2x = 2 \times 20^\circ = 40^\circ = 40^\circ \times \frac{\pi}{180} = \frac{2\pi}{9} jSM; u$$

$$\angle B = 3x = 3 \times 20^\circ = 60^\circ = 60^\circ \times \frac{\pi}{180} = \frac{\pi}{3} jSM; u$$

$$\angle C = 4x = 4 \times 20^\circ = 80^\circ = 80^\circ \times \frac{\pi}{180} = \frac{4\pi}{18} jSM; u$$

$$vr% f=Hkqt ds dks k 40^\circ, 60^\circ, 80^\circ gftuds jSM; u eku \varnothing e'k% \frac{2\pi}{9}, \frac{\pi}{3}, \frac{4\pi}{18} gA$$

$$\text{မူလ်} 18 \quad x = a \sec \theta \quad \text{ရန်နဲ့} \quad y = b \tan \theta \quad ၁၄၂$$

$$\frac{x}{a} = \sec \theta \quad \dots \dots \dots \text{(i)} \quad \text{ရန်နဲ့} \quad \frac{y}{b} = \tan \theta \quad \dots \dots \dots \text{(ii)}$$

I eh- (i) o (ii) dk oxl dj ds(i) I s(ii) dks?kVkus ij

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = \sec^2 \theta - \tan^2 \theta \quad \left[\begin{array}{l} \because 1 + \tan^2 \theta = \sec^2 \theta \\ 1 = \sec^2 \theta - \tan^2 \theta \end{array} \right]$$

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1.$$

၁၅နှစ်

$$\text{ekuk} \quad x = a \cos \theta - b \sin \theta \quad \dots \dots \dots \quad ၁၅၂$$

$$\text{ရန်နဲ့} \quad y = a \sin \theta + b \cos \theta \quad \dots \dots \dots \quad ၁၅၃$$

I eh-dj.k ၁၅၂ o ၁၅၃ dks oxl dj ds tkMus ij

$$x^2 + y^2 = a^2 (\cos^2 \theta + \sin^2 \theta) + b^2 (\cos^2 \theta + \sin^2 \theta) \\ - 2ab \cos \theta \sin \theta + 2ab \sin \theta \cos \theta$$

$$x^2 + y^2 = a^2 + b^2 \quad \left[\because \sin^2 \theta + \cos^2 \theta = 1 \right]$$

$$\text{မူလ်} 19 \quad ?\text{ku} \quad \text{I s dkVs x; scMs I scMs' kdlq dk v k; ru V} \quad = \frac{1}{3} \pi r^2 h \quad ၁၅၂$$

$$fn; k g\$ h = 3 \quad | \quad eh-$$

$$'kdlq ds v k/kk j dk 0; k l = 2r = 3 \quad | \quad eh-$$

$$r = \frac{3}{2} \quad | \quad eh-$$

$$\text{eku j [kus ij]} \quad V = \frac{1}{3} \pi \left(\frac{3}{2} \right)^2 . 3 = \frac{9}{4} \pi$$

$$V = 2.25 \pi \quad ?\text{ku} \quad | \quad eh-$$

$$\frac{1}{4}\pi FkOk\frac{1}{2}$$

ekuk xsys dh f=T; k = r

fn; k g\\$ xsys dk i "Bh; {k\\$Qy = 616 oxz l seh

$$\Rightarrow 4\pi r^2 = 616 \Rightarrow 4 \times \frac{22}{7} \times r^2 = 616 \Rightarrow r^2 = \frac{7 \times 616}{4 \times 22}$$

$$\Rightarrow r^2 = 7 \times 7 \Rightarrow r = 7 \text{ l seh}$$

$$\therefore xsys dk v k; ru = \frac{4}{3}\pi r^3 = \frac{4}{3} \times \pi \times (7)^3 = \frac{4}{3} \times \pi \times 7 \times 7 \times 7$$

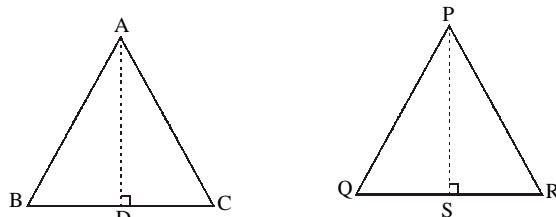
$$= \frac{1372}{3}\pi \text{ ?ku l seh}$$

mÙkj 20- i es dFku nks l e: i f~~kk~~Hk~~kk~~ ds {k~~kk~~QYk dk v~~kk~~kkRk fdughanks L~~kk~~Rk Hk~~kk~~v~~kk~~ ds ok~~kk~~ ds v~~kk~~kkRk ds ckj kckj gk~~kk~~ks g\\$ 14½

Kkr g\\$% nks l e: i f=Hk~~kk~~ ABC v~~kk~~ PQR

$$fI) djuk g\$% \frac{\{k\$Qy \Delta ABC}{\{k\$Qy \Delta PQR} = \frac{AB^2}{PQ^2} = \frac{BC^2}{QR^2} = \frac{AC^2}{PR^2}$$

jpu~~k~~ % AD ⊥ BC v~~kk~~ PS ⊥ QR [k~~kk~~ka]



mi if~~kk~~ %

dFku	dkj.k
$\frac{\{k\$Qy \Delta ABC}{\{k\$Qy \Delta PQR} = \frac{\frac{1}{2} BC \times AD}{\frac{1}{2} QR \times PS}$	
$\frac{\{k\$Qy \Delta ABC}{\{k\$Qy \Delta PQR} = \frac{BC}{QR} \times \frac{AD}{PS} \quad \dots\dots (i)$	

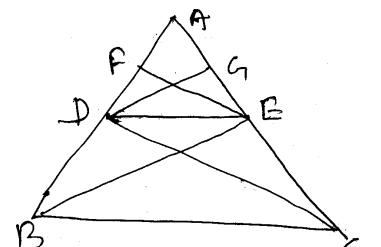
<p>VC f=H₁ ADB v₂ PSQ e₃</p> <p>$\angle B = \angle Q$</p> <p>$\angle ADB = \angle PSQ = 90^\circ$</p> <p>$\Delta ADB \sim \Delta PSQ$</p> <p>$\frac{AD}{PS} = \frac{AB}{PQ} \quad \dots \text{(ii)}$</p>	<p>I e: i Δ ds I xr dks k cjk cj g₁ i R; d 90° dk g₂ ½ j puk I s ½ AA I e: i rk mi i es I s</p> <p>I e: i Δ dh I xr H₁ k; 8 I ekui j kfrd gks h g₂</p>
<p>ydu $\frac{AB}{PQ} = \frac{BC}{QR} \quad \dots \text{(iii)}$</p> <p>$\therefore \frac{AD}{PS} = \frac{BC}{PQ} \quad \dots \text{(iv)}$</p> <p>$\frac{\{k\}Qy \Delta ABC}{\{k\}Qy \Delta PQR} = \frac{BC}{QR} \times \frac{BC}{QR} = \frac{BC^2}{QR^2}$</p> <p>bl i dkj fl) dj I drsg fd</p> <p>$\frac{\{k\}Qy \Delta ABC}{\{k\}Qy \Delta PQR} = \frac{AB^2}{PQ^2}$</p> <p>v₂ $\frac{\{k\}Qy \Delta ABC}{\{k\}Qy \Delta PQR} = \frac{AC^2}{PR^2}$</p> <p>vFkkr~</p> <p>$\frac{\{k\}Qy \Delta ABC}{\{k\}Qy \Delta PQR} = \frac{AB^2}{PQ^2} = \frac{BC^2}{QR^2} = \frac{AC^2}{PR^2}$</p>	<p>(ii) O (iii) I s</p> <p>(i) O (iv) I s</p> <p>bfr fl) e</p>

Fkylk lkEks & , d f=Hkqt dh , d Hkqt k ds l ekrij [khph xbz jsk vU; nks Hkqt kvkadsftu nksfcnyka i j i frPNn djrh gSosfcnqHkqt kvkads l eku vuq kr eafoHkDr djrsqA

Kkr g\\$% ΔABC e@ DE||BC

fl) djuk gS% $\frac{AD}{DB} = \frac{AE}{EC}$

jpu k % (i) B dks E I s rFkk C dks D I s feyk; kA



(ii) $EF \perp AB$ [

(iii) $DG \perp AE$ [

mi i fYk %

dFku	dkj . k
$\Delta dk \{k\} Qy \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$ $\frac{\Delta ADE dk \{k\} Qy}{\Delta BDE dk \{k\} Qy} = \frac{\frac{1}{2} AD \cdot EF}{\frac{1}{2} BD \cdot EF} = \frac{AD}{BD} \dots(i)$ bl h i dkj] $\frac{\Delta ADE dk \{k\} Qy}{\Delta CDE dk \{k\} Qy} = \frac{\frac{1}{2} AE \cdot DG}{\frac{1}{2} EC \cdot DG} = \frac{AE}{EC} \dots(ii)$ ydu] $\Delta BDE dk \{k\} Qy \frac{1}{2}$ $\Delta CDE dk \{k\} Qy \dots(iii)$ $vr\% = \frac{AD}{BD} = \frac{AE}{EC}$	d gh vklkj vks , d gh l ekj jskkvka ds chp cusf=Hkjt dk $\{k\} Qy cjkj gksk gA$ (i), (ii), (iii) s bfr fl) e

mUkj 21- Fkks Eka xna dh dy l ; k 4 \$ 5 \$ 7 ¾ 16

$$n(S) = 16$$

(i) 7 l Qn xna eal sdkb, d l Qn xna fudkyh tk l drh gA

$$n(A) = 7$$

$$vr\% LkQn xna fudkyus dh i kf; drk \quad P(A) = \frac{n(A)}{n(S)}$$

$$P(A) = \frac{7}{16}$$

(ii) LkQn , lk dkYkh xna fudkyus dh i kf; drk

$$P(A) = \frac{7}{16} + \frac{4}{16}$$

$$\frac{7+4}{16} \quad \frac{11}{16}$$

1/4/2022

dy | Ekkfor ?Vuk; n(S) 3/4 52

(i) i ku dk rk'k fudkyus dh ?Vuk A gks rks

$$n(A) 3/4 13$$

$$P(A) = \frac{n(A)}{n(S)} 3/4 \frac{13}{52} = \frac{1}{4}$$

(ii) i ku ; k bV dk , Ddk fudkyus dh ?Vuk A gks rks

$$n(A) 3/4 1 + 1 = 2$$

$$P(A) = \frac{n(A)}{n(S)} 3/4 \frac{2}{52} = \frac{1}{26}$$

$$\text{mUkj } 22 \quad \text{fn,kk gS } x = \frac{3ab}{a+b} \text{ gks rks } \frac{2x+3a}{2x-3a} + \frac{2x+3b}{2x-3b} = 2 \quad 15/2$$

$$\frac{x}{3a} = \frac{b}{a+b}$$

2 dk xqkk djus ij

$$\frac{2x}{3a} = \frac{2b}{a+b}$$

$$\frac{3b+a}{b-a} + \frac{3a+b}{-(b-a)} \quad , \text{kkkkkjkkkRk fuk,kEk Lks}$$

$$\frac{2x+3a}{2x-3a} = \frac{3b+a}{b-a} \quad \dots \dots \dots \quad (1)$$

rFkk i q%

$$\frac{x}{3b} = \frac{a}{a+b}$$

2 dk xqkk djus ij

$$\frac{2x}{3b} = \frac{2a}{a+b}$$

$$\frac{2x+3b}{2x-3b} = \frac{2a+(a+b)}{2a-(a+b)} \quad , \text{kkkkkkj kkkkkk fuk, kEk Lks}$$

$$\frac{2x+3b}{2x-3b} = \frac{3a+b}{a-b} = \frac{3a+b}{-(b-a)} \quad \dots \dots \dots \quad (2)$$

LkEkdj . k 1/2 RkFkk 1/2 dkls TkkMUs lkj

$$\Rightarrow \frac{2x+3a}{2x-3a} + \frac{2x+3b}{2x-3b} = \frac{3b+a}{b-a} + \frac{3a+b}{-(b-a)}$$

$$\begin{matrix} \frac{3b+a-3a-b}{b-a} \\ \frac{2(b-a)}{b-a} \\ \frac{2}{b-a} \end{matrix}$$

3/4 2

1/4 Fkk 1/2

i Eke LkEkkkkkj Js kh ds fy, a=1, d=1

$$S_1 = \frac{n}{2}[2 \times 1 + (n-1) \times 1]$$

$$S_1 = \frac{n}{2}[2 + n - 1]$$

$$S_1 = \frac{n}{2}[n + 1]$$

f}rh; LkEkkkkkj Js kh ds fy, a=2, d=3

$$S_2 = \frac{n}{2}[2 \times 2 + (n-1) \times 3]$$

$$S_2 = \frac{n}{2}[4 + 3n - 3]$$

$$S_2 = \frac{n}{2}[3n + 1]$$

r̄rh; LkEkkukkakj Js kh ds fy, a = 3, d = 5

$$S_3 = \frac{n}{2}[2 \times 3 + (n-1) \times 5]$$

$$S_3 = \frac{n}{2}[6 + 5n - 5]$$

$$S_3 = \frac{n}{2}[5n + 1]$$

i Eke] f}rh; ,oarrh; I ekUrj Jf.k; k.adk ; kx

$$S_1 + S_2 + S_3 = \frac{n}{2}[n+1] + \frac{n}{2}[3n+1] + \frac{n}{2}[5n+1]$$

$$= \frac{n}{2}[n+1 + 3n+1 + 5n+1]$$

$$= \frac{n}{2}[9n+3]$$

$$= \frac{3n}{2}[3n+1]$$

$$= \frac{3}{2}(3n+1)n$$

mūkj 23 ?ku'; ke dh okf"kd vk; 15½

1- ey oru l svk; 12500 x 12 ekg ¾ 1]50]000 : -

egxkbz HkYkk l svk; 6300 x 12 ekg ¾ 75600 : -

vr%dy okf"kd vk; ¾ 2]25]600 : -

2- dj e NW ; k; j kf'k okf"kd

½ okf"kd l kekU; Hkfo"; fuf/k e v'knku 2000 x 12 ¾ 24]000 : -

½ th vkbl , l okf"kd i fe; e 250 x 12 ¾ 3]000 : -

½ okf"kd thou chek i fe; e ¾ 69]000 : -

½ okf"kd Mkd thou chek i fe; e ¾ 10]000 : -

dj e NW ; k; j kf'k ½a + b + c + d½

24]000 \$ 3]000 \$ 69]000 \$ 10]000 ¾ 1]06]000 : -

i jUrqvf/kdre NW ; k; jkf'k 1]00]000 : - rd lhfer gA

rc dj e NV ; k; jkf'k ¾ 1]00]000 : -

3- dj ; k; jkf'k 2]25]600 : - & 1]00]000 : - ¾ 1]25]600 : -

4- vk; dj ¾ ¼]25]600 & 1]10]000½ ¾ 15600 dk 10%

$$\frac{3}{4} 15,600 \times \frac{10}{100} \quad \frac{3}{4} 1560 : -$$

5- f'k{k midj ¾ 1560 rd 3%

$$\frac{3}{4} 1560 \times \frac{3}{100} \frac{3}{4} 46-80 \quad \frac{3}{4} 47 : -$$

6- ns dy vk; dj ¾ 1560 \$ 47 ¾ 1607 : -

vr%?ku'; ke }kjk dy ns vk; dj ¾ 1607 : -

½FKOK½

mÙkj 23 'kkfyuh dh okf"kd vk;

1- dfork dh dy okf"kd vk; $\frac{3}{4}$ 1]80]000 : -

2- dj e NV ; k; jkf'k

½a½ okf"kd l kekJ; Hkfo"; fuf/k e v'knku $\frac{3}{4}$ 40]000 : -

½b½ th vkbz , l okf"kd i hfe; e 250 x 12 $\frac{3}{4}$ 3]000 : -

dj e NV ; k; jkf'k ½a + b½ ¾ 40]000 \$ 3]000 \$ 10]000 $\frac{3}{4}$ 53]000 : -

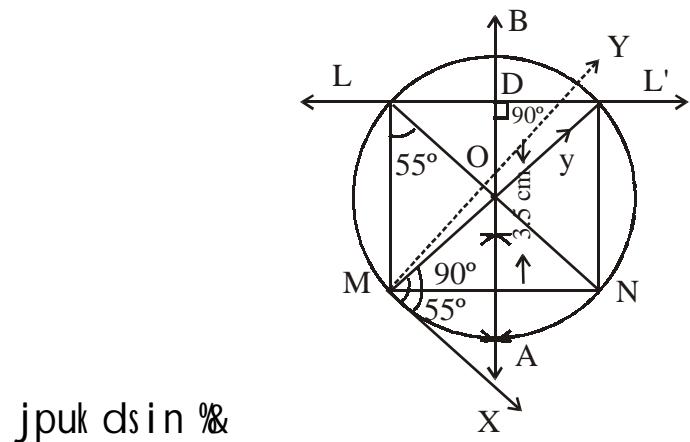
i jUrqvf/kdre NW ; k; jkf'k 1]00]000 : - rd lhfer gA

3- dj ; k; jkf'k ¾ 1]80]000 : - & 53]000 : - ¾ 1]27]000 : -

4- vk; dj ¾ 1]27]000 : - rd dkbz dj ughA

vr% 'kkfyuh dks dkbz dj ugha nsuk i MxkA

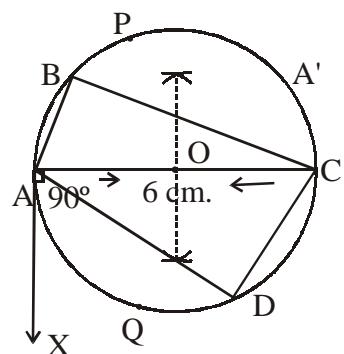
mÜkj 24



jpuk dsin %

$$\frac{1}{4}\sqrt{Fk0k\frac{1}{2}}$$

mÜkj 24



jpuk dsin %

mÙkj 25-

15½

oxkz vkkjkYk	0&10	10&20	20&30	30&40	40&50	; kx
ckkj ðkkj Rkk	4	8	10	11	16	49
I p; h ckjcjrk	4	12	22	33	49	

i nkad h I ð; k N ¾ 49

ef/; dk I ð; k ¾ $\frac{N}{2}$ ¾ 24.5

tksf d I p; h ckjcjrk 33 dsvr xk vkrk g

ef/; dk oxz 30&40

ef/; dk oxz dh fuEu I hek ¾ 30

ef/; dk oxz dh mPp I hek ¾ 40

ef/; dk oxz dh vkoFr ¾ 11

ef/; dk oxz dsBhd i gys dh I p; h vkoFr ¾ 22

$$ef/; dk \frac{3}{4} L_1 + \frac{(m-c)(L_2 - L_1)}{f}$$

$$\frac{3}{4} 30 + \frac{(24.5 - 22)(40 - 30)}{11} = 30 + \frac{2.5 \times 10}{11}$$

$$\frac{3}{4} \quad 30 + \frac{25}{11} = 30 + 2.27$$

ef/; dk $\frac{3}{4}$ 32.27

$\frac{1}{4} \sqrt{Fkdk\frac{1}{2}}$

0&10	10&20	20&30	30&40	40&50	50&60	60&70
8	15	21	37	31	14	12

I kj.kh I sLi "V gSfd I cl svf/kd ckjcrk 37 gS tk oxl 30&40 dh gA

vr%cgYd oxl 30&40

cgYd oxl dh fuEu I hek $\frac{3}{4}$ 30

cgYd oxl dh mPp I hek $\frac{3}{4}$ 40

$$f_1 = 37, \quad f_0 = 21, \quad f_2 = 31$$

cgYd oxl dh fuEu I hek

$$\frac{3}{4} \quad L_1 + \frac{f_1 - f_0}{2f_1 - f_0 - f_2} (L_2 - L_1)$$

$$\frac{3}{4} \quad 30 + \frac{37 - 21}{2 \times 37 - 21 - 31} (40 - 30) = 30 + \frac{16}{74 - 52} \times 10$$

$$\frac{3}{4} \quad 30 + \frac{160}{22} = 30 + \frac{80}{11} = 30 + 7.27$$

$$\frac{3}{4} \quad 37.27$$

mÙkj 26 ekuk filRkk dh oržku vk,kq x o"kl vks lkk dh oržku vk,kq y o"kl gSgA $\frac{1}{6}\frac{1}{2}$
 1 o"kl i nZ firk dh vk; q $\frac{3}{4}$ (x - 1) o"kl
 1 o"kl i nZ i f dh vk; q $\frac{3}{4}$ (y - 1) o"kl

ଇତୁକୁଣ୍ଡିଜୀ କେବେ କ୍ରିତ୍ତମାନୀୟ

$$(x - 1) = (y - 1).8$$

$$x - 1 = 8y - 8$$

$$x - 8y = -8 + 1$$

$$x - 8y = -7$$

$$x = 8y - 7 \quad \dots \dots \dots \text{(i)}$$

ଫର୍ମାନ୍ତରେ କ୍ରିତ୍ତମାନୀୟ

$$x = y^2 \quad \dots \dots \dots \text{(ii)}$$

ଲେଖି (i) ଲେଖି ଦିଲ୍ଲି ଏକୁ ଜାକୁ କିମିଟିକି

$$8y - 7 = y^2$$

$$\Rightarrow y^2 - 8y + 7 = 0$$

$$\Rightarrow y^2 - y - 7y + 7 = 0$$

$$\Rightarrow y(y - 1) - 7(y - 1) = 0$$

$$\Rightarrow (y - 1)(y - 7) = 0$$

$$\Rightarrow (y - 1) = 0 ; \text{ } y - 7 = 0 \Rightarrow y = 1 ; \text{ } y = 7$$

$$\Rightarrow y = 1^2 ; \text{ } y = 7^2 \Rightarrow y = \pm 1 ; \text{ } y = \pm 7$$

ଦିଲ୍ଲି ଫିରିବି ଯାଏ କି କେବେ କ୍ରିତ୍ତମାନୀୟ ଉପରେ କେବେ କିମିଟିକି ଏକୁ କିମିଟିକି ଏକୁ କିମିଟିକି

କେବେ କିମିଟିକି

ଏକୁ କିମିଟିକି ଏକୁ କିମିଟିକି, ନିର୍ମାଣ କିମିଟିକି (x + 2) କିମିଟିକି

$$\text{ଇତୁକୁଣ୍ଡିଜୀ} \quad x^2 + (x + 2)^2 = 164$$

$$\begin{aligned}
 & \Rightarrow x^2 + (x^2 + 4x + 4) = 164 \\
 & \Rightarrow 2x^2 + 4x + 4 = 164 \\
 & \Rightarrow 2(x^2 + 2x + 2) = 164 \\
 & \Rightarrow x^2 + 2x + 2 - 82 = 0 \\
 & \Rightarrow x^2 + 2x - 80 = 0 \\
 & \Rightarrow x^2 - 8x + 10x - 80 = 0 \\
 & \Rightarrow x(x - 8) + 10(x - 8) = 0 \\
 & \Rightarrow (x - 8)(x + 10) = 0 \\
 & x - 8 = 0 ; \quad x + 10 = 0 \\
 & x = 8 ; \quad x = -10
 \end{aligned}$$

x dk eku __. lkRed ugha gks l drk] vr% x = 8

∴ n̄ jh d̄ekxr | {; k, ags(x + 2) = 8 + 2 = 10
vr%v̄k̄h"V | f; k, i 8, 10 q̄k̄hA

mÙkj 27 fn; k qS% LkEkCkkqg f«kHkqTk Å ABC qSftI dh AD Åpkbz qA

1/61/2

f) $\text{djuk gS: } 3BC^2 = 4AD^2$

mi i fRr % \wedge ABC \rightarrow AB = BC = AC

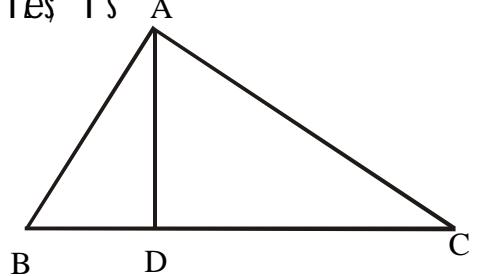
$$\forall j \quad AD \perp BC, BD = CD = \frac{BC}{2} \quad \dots \dots \dots (i)$$

I edks k f«kHkT_k Δ ABD e a i kbFkkxkj I i es I s A

$$\Rightarrow AB^2 = AD^2 + BD^2$$

$$\Rightarrow AB^2 = AD^2 + \left(\frac{BC}{2} \right)^2$$

$$\Rightarrow AB^2 = AD^2 + \frac{BC^2}{4}$$



$$\Rightarrow BC^2 = AD^2 + \frac{BC^2}{4} \quad (\because AB = BC)$$

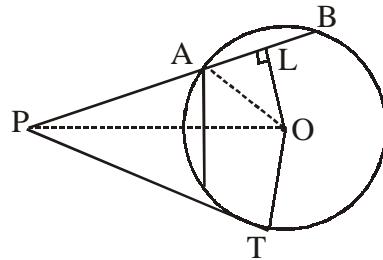
$$\Rightarrow BC^2 - \frac{BC^2}{4} = AD^2$$

$$\Rightarrow 4BC^2 - BC^2 = 4AD^2$$

$$\Rightarrow 3BC^2 = 4AD^2 \quad \text{f1) gvkA}$$

1/4 Fk0kk1/2

mUkj 27 fn; k gS C(O, r) gS PAB Nnd jskk rFkk PT Li 'kz jskk gA



$$\text{f1) djuk gS \% PA.PB} = (PT)^2$$

jpu k % OL \perp AB [kpk A OA, OP vks OT dksfeyk; k

$$\begin{aligned} \text{mi i fkr \% PA.PB} &= (PL - AL)(PL + LB) \\ &= (PL - AL)(PL + AL) \quad (\because AL = LB) \\ &= PL^2 - AL^2 \\ &= (OP^2 - OL^2) - AL^2 \end{aligned}$$

$$\therefore \text{ledksk } \Delta PLO \text{ eis } OP^2 = OL^2 + PL^2.$$

$$\begin{aligned} &= OP^2 - OL^2 - AL^2 \\ &= OP^2 - (OL^2 + AL^2) \\ &= OP^2 - OA^2 \end{aligned}$$

$$\therefore \text{ledksk } \Delta ALO \text{ eis } OA^2 = OL^2 + AL^2.$$

$$= \text{OP}^2 - \text{OT}^2$$

$$= \text{PT}^2$$

\therefore L e d k s k Δ PTO e s $\text{OP}^2 = \text{PT}^2 + \text{OP}^2$.

$$\text{PA.PB} = \text{PT}^2$$

Set - C

gkbz Ldy | fMQdV ijhkk

High School Certificate Examination

| fiy&itu i=

SAMPLE PAPER

fo'k; % (Subject) - xf.kr (Mathematics)

le; 3 ?k.VK (Time- 3 Hrs)

d{kk % (Class) - nI oh (X)

iWkd 100 (M.M.)

(Instruction) & Vunzh

- 1- **I hh itu gy djuk vfuok; ZgSA**

Attempt all the Question

- 2- **itu Øekd 01 e 10 vd fu/kkjrh gSA nks dky [k.M gSA [k.M ^v** e 05
cgjodYih; itu rFkk [k.M ^c** e 05 fjDr LFkkuk dh i firz vFkok mfpr
I cak tkSM, A iR; d itu dsfy, 1 vd vkcfVr gSA**

Q. No. 01 Carries 10 Marks. There are two sub-section, Section A is Multiple choice carries 05 marks and section B is fill in the blanks or match the column carries 05 marks.

- 3- **itu Øekd 02 I situ Øekd 09 rd vfr y?kmRrjh; itu gSA iR; d itu
ij 02 vd vkcfVr gSA mRrj dh vf/kdre 'kCn I hek 30 'kCn A**

Q. No. 2 to 09 are very short answer type question & it carries 02 marks each. Word limit is maximum 30.

- 4- **itu Øekd 10 I situ Øekd 15 rd y?kmRrjh; itu gSA iR; d itu ij 03
vd vkcfVr gSA mRrj dh vf/kdre 'kCn I hek 50 'kCn A**

Q. No. 10 to 15 are short answer type question & it carries 03 marks each. Word limit is maximum 50.

- 5- **itu Øekd 16 I situ Øekd 21 rd y?kmRrjh; itu gSA iR; d itu ei
vkrfjd fodYi gSvkj iR; d itu ij 04 vd vkcfVr gSA mRrj dh vf/kdre
'kCn I hek 75 'kCn A**

Q. No. 16 to 21 are short answer type question & it carries 04 marks each. Each question has internal choice. Word limit is maximum 75.

6- itu Øekd 22 ls itu Øekd 25 rd nh?kñRrjh; itu gSA iR; d itu e
vkrfjd fodYi gSvkj iR; d itu ij 05 vd vkcVr gSA mRrj dh vf/kdre
'kCn l hek 100 'kCn A

Q. No. 22 to 25 are long answer type question & it carries 05 marks each. Each question has internal choice. Word limit is maximum 100.

7- itu Øekd 26 ls itu Øekd 27 rd nh?kñRrjh; itu gSA iR; d itu e
vkrfjd fodYi gSvkj iR; d itu ij 06 vd vkcVr gSA mRrj dh vf/kdre
'kCn l hek 150 'kCn A

Q. No. 26 to 27 are long answer type question & it carries 06 marks each. Each question has internal choice. Word limit is maximum 150.

it u 1 ½ l gh fodYi pfu, %

- (i) 6 vks 54 dk Ek/kkRkh gkkA
- (a) 9 (b) 18 (c) 12 (d) 21
- (ii) 50° dk vdk EkkIk gkkA
- (a) 30^0 (b) 60^0 (c) 45^0 (d) 90^0
- (iii) okuk dks dkbz Tkhhk fdRkoks fckunyka lkj dkVRkh gSA
- (a) 2 (b) 1 (c) 3 (d) 4
- (iv) 0.625 dk f) vklkjh lkz kkYkh Eka EkkIk gkkA
- (a) 0.001 (b) 1.001 (c) 0.100 (d) 0.101
- (v) 3] 6] 2] 7] 5] 9] 8 dk Ekkf/kdk gkkA
- (a) 5 (b) 6 (c) 7 (d) 8
- (A) Choose the correct answer-
- (i) Mean proportional of 6 and 54 is -
- (a) 9 (b) 18 (c) 12 (d) 21
- (ii) Value of 50^g in degree is -
- (a) 30^0 (b) 60^0 (c) 45^0 (d) 90^0
- (iii) The chords of a circle intersect the circle at point -
- (a) 2 (b) 1 (c) 3 (d) 4
- (iv) Value of 0.625 in Binary number is -
- (a) 0.001 (b) 1.001 (c) 0.100 (d) 0.101
- (v) Medium of 3, 6, 2, 7, 5, 9 and 8 is -

(a) 5

(b) 6

(c) 7

(d) 8

1/2 f j D R k L F k k U k k a d h I k R k Z d h f T k , A

- (i) 1 v k s 50 d s E k / , k f o k " k E k I k n k a d h L k [, k k &&&& g k x k h A
- (ii) Y k E C k f < k H k q T k , k f i z E k E k a d y k Q Y k d 1/2 B 1/2 d h L k [, k k &&&& g k x k h g A
- (iii) m L k f k k U n q d k H k q T k &&&&&& g k x k k T k k s y - v { k E k a f L F k R k g A
- (iv) sin(90 - θ) 3/4 &&&&& g k x k k A
- (v) 8 E k h V j v k s 6 E k h V j H k q T k k O k k Y k s v k , k R k d s f o k d . k z d h Y k E C k k b Z &&&&& g k x k h A

(B) Fill in the Blanks -

- (i) The number of terms of odd number between 1 and 50 is
- (ii) The number of faces of a right triangular prism is
- (iii) The coordinate of a point of y-axis are
- (iv) Value of sin(90 - θ) is
- (v) Length of diagonal of rectangle is whose sides are 8m and 6m.

it u 2 $\frac{x+1}{x-2}$ v k s $\frac{x-1}{x-2}$ d k , k k k Q Y k K k R k d h f T k , A

Find the sum of $\frac{x+1}{x-2}$ and $\frac{x-1}{x-2}$

it u 3 O k X k Z L k E k h d j . k $15x^2 + x - 2 = 0$ d s E k V k k a d k , k k k Q Y k , O k a X k q k U k Q Y k K k R k d h f T k , A

Find the sum product of roots of the quadratic equation $15x^2 + x - 2 = 0$

itzu 4 $\frac{\cos ec 39^\circ}{\sec 51^\circ}$ dk Ekkuk Kkrk dhftk, A

Find the value of $\frac{\cos ec 39^\circ}{\sec 51^\circ}$

itzu 5 fckunq 1/2] 3/2 vks 1/4] 1/2 ds ckpk dh njh Kkrk dhftk, A

Find the distance between (2, 3) and (4, 1)

itzu 6 , d 'kdqdsvk/kkj dh fØ,kk 7 Lkh vks Åpkkbz 15 Lkh gsrkks 'kdqdk vks kkrk dhftk, A

Find the volume of cone whose height is 15 cm. and radius of base is 7 cm.

itzu 7 fkkqk DEF EkaDE vks DF ij fcunqP vks Q bl i dkj gsf d DP = 5 Lkh QF = 24 Lkh DE = 13 Lkh Rkfk DF = 39 Lkh fn[kkb; s PQ||EF-

In Δ DEF, DP = 5 cm., QF = 24 cm., DE = 13 cm. and DF = 39 cm.
Show that PQ||EF or not.

itzu 8 vYXkksj FkEk dsfu: i .k dk nks i dkj fyf[k, A

Write two types of or developed an algorithm.

itzu 9 45 Eka Lks 15 dks kjd vd fLk) kurk Lks ?kvkb, kA

Subtract 15 from 45 by complement theory.

itzu 10 , kfn $R = \frac{x^3 + 1}{x - 1}$ vks $S = \frac{x^2 - x + 1}{x + 1}$ gks Rkks $\frac{R}{S}$ dk Ekkuk Kkrk dhftk, A

If $R = \frac{x^3 + 1}{x - 1}$ and $S = \frac{x^2 - x + 1}{x + 1}$, then find the value of $\frac{R}{S}$

itzu 11 , kfn $a : b = c : d$ gks Rkks fLk) dhftk, fd $\frac{a}{b} = \frac{a+c}{b+d}$

If $a : b = c : d$, then prove that $\frac{a}{b} = \frac{a+c}{b+d}$

itzu 12 D,kk 302 Js kh 3]8]13]&&&& dk dkboZ lkn gA

Is 302 a term of the series 3, 8, 13,

itzu 13 EkUkkTk dkfkkj lks 100 : - lkfrkEkkg dh nj lks 2 ok"kz ds fYk, vkrkrkhz TkEkk [kkRkk
[kkYkkA ,kfn C,kkTk dh nj 5½ lkfrk'krk okkf"kd gks Rkks mLks nks ok"kz Ckkn fdRkukh
jdek dh lkfrk gkxkhA

Manoj KUMAR opened a recurring deposit account of Rs. 100 per month for 2 years. If the rate of interest is 5½% p.a., then calculate how much amount will be receive after 2 years.

itzu 14 LkOKLkfEkdk $\sin^4 \theta + \cos^2 \theta = 1 - 2\sin^2 \theta \cdot \cos^2 \theta$ lks fLk) dhftk, A

Prove that : $\sin^4 \theta + \cos^2 \theta = 1 - 2\sin^2 \theta \cdot \cos^2 \theta$

itzu 15 mLk CkMs lks CkMs XkkYks dk vkrkrkhz Kkrk dhftk, Tkks mLk ?uk lks dkVk Tkks
fTkLkdh dkj 6 Lkekh dh gA

Find the volume of the greatest sphere which can be cut from a cube whose edge is 6 cm.

itzu 16 a ds fdLk Ekkuk ds fYk, fcknq 1/4] 4/1] 1/2, & 2/1 vks 1/3] 16/1 Lkej[s k gkxk& 1/4/1

For what value of a , the point $(1, 4)$, $(a - 2)$ and $(-3, 16)$ will be colliner.

1/4Fokk½ (OR)

mLk fckHkTk dk dhaed Kkrk dhftk, fTkLkdhs 'kh"kk ds fuknkkd 1/4] 3/1 1/2] & 3/1
1/3] 5/1 gA

Find the centroid of a triangle whose vertices are $(4, 3)$, $(2, -3)$ and $(-3, 5)$.

Ikz Uk 17 fdlkh f₂kHkqTk ds dks k LkEkkRkj Js kh Eka gS LkCkLks CkMs dks k dk EkkUk 105° gS RkhUkka dks kka ds EkkUk dk jSM, kUk Eka KkRk dhfTk, A 1½

The angles of a triangle are in A.P. The biggest angle is 105°. Find the angles in radian.

1½ (OR)

, d f₂kHkqTk ds dks k 28% Eka gS A f₂kHkqTk ds dks kka ds EkkIk jSM, kUk Eka KkRk dhfTk, A

The angles of a triangle are in the ratio 2 : 3 : 4. Find the measures of angles in radian.

Ikz Uk 18 $x = a \sec \theta$ Rkfkk $y = b \tan \theta$ gks Rkks fLk) dhfTk, fd $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$. 1½

If $x = a \sec \theta$ and $y = b \tan \theta$ then prove that : $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$

1½ (OR)

kfn $x = a \cos \theta - b \sin \theta$ Rkfkk $y = a \sin \theta + b \cos \theta$ gks Rkks fLk) dhfTk, fd $x^2 + y^2 = a^2 + b^2$.

If $x = a \cos \theta - b \sin \theta$ and $y = a \sin \theta + b \cos \theta$ then prove that : $x^2 + y^2 = a^2 + b^2$.

Ikz Uk 19 mIk CMs Lks CMs 'kqdk vkl, kRkuk KkRk dhfTk, Tkks mLk ?kUk Eka Lks dkVk Xk, kk gS fTkLkdhi dksj YkakkbZ 3 LksEkh- gA 1½

Find the volume of the greatest cone which can be cut from a cube whose edge is 3 cm.

1½ (OR)

fdLkh XkksLks dk lk" Bh, k {k&kQYk 616 OKkZ LkEkh- gks Rkks XkksLks dk vkl, kRkuk KkRk

dhfTk, A

The curved surface of sphere is 616 cm^2 then find the volume of sphere.

Ikz Uk 20- nks LkkEKKU, k f«kHkqTkka ds {k&kQYk dk vUkHkRk fdUgha nks LkHkRk HkqTkkvka ds OkXkk ds vUkHkRk ds ckjckj gkks gA 14½

Prove that the ratio of the areas of two similar triangles is equal to the ratio of the squares of any two corresponding sides.

1/4Fkokk½ (OR)

FkYlk lkEksh fYkf[k, , okafLk) dhfTk, A

State and prove that Thales theorem.

Ikz Uk 21- , d FkYks Eka 4 dkYkh] 5 YkkYk] RkFkk 7 LkQn Xkn gA , kfn , d Xkn , kknPN, kk fukalkYkh Tk, k Rkks bLkdh lkf, kdRkk D, kk gkYkh fd fukalkYkh XkbZ Xkn & (i) LkQn gkYkh (ii) LkQn , kk dkYkh A

A bag contains 6 black, 5 red and 7 white balls. If one ball is drawn at random. What is probability that the ball drawn will be - (i) White, (ii) White or black.

1/4Fkokk½ (OR)

vPNh lkdkj Lks Qvh XkbZ 52 Rkk'kkad h , d XkMMh EkaLks , d Rkk'k , kknPN, kk [khRkk Tk, Rkks fukEUk dh lkf, kdRkk KkRk dhfTk, A

(i) , d iku dk rk'k gA (ii) iku ; k bW dk , Ddk gA

From a well shuffled pack of 52 cards, one card drawn at random. Find the probability of the following -

- (i) One card is of heart
- (ii) Ace of heart or diamond.

Ikz Uk 22 ,kfn $x = \frac{3ab}{a+b}$ gks Rkk fLk) dhfTk, fd $\frac{2x+3a}{2x-3a} + \frac{2x+3b}{2x-3b} = 2$. 15½

If $x = \frac{3ab}{a+b}$, then prove that $\frac{2x+3a}{2x-3a} + \frac{2x+3b}{2x-3b} = 2$

14Fkok½ (OR)

Rkhuk LkEkkukkjkj Jf.k, kka ds n lknka dk ,kkQYk ØEk'k% S₁, S₂, S₃ gA fTkukds IkkEk Ek lkn 1] 2] 3 RkFkk Lkkokjkj ØEk'k% 1] 3] 5 gA Rkk fLk) dhfTk, fd & If S₁, S₂, S₃ be the sum of n terms of three A.P. and their first terms are 1, 2, 3 respectively and common difference are 1, 3, 5, then prove that

$$S_1 + S_2 + S_3 = \frac{3}{2}(3n+1)n$$
 15½

Ikz Uk 23 ?uk' ,kkEk dk Ekwk okRuk ikfrkekkg 12500 : lk,ks gA RkFkk EkgkkbZHkukk ikfrkekkg 6300 : lk,ks lkkrk djRkk gSA ,kfn okg LkEkkU,k Hkfok",k fulf/k Eka ikfrkekkg 2000 : -] th vkbZ, l - ea ikfrkekkg 250 : - RkFkk HkjRkh,k Tkholuk ckhekk ikhfek,kek Eka ikfrkok"kz 69000 : - ,oa Mkd?kj Tkholuk ckhekk ikhfek,kek ikfrkok"kz 10000 : - TkEkk djRkk gSA mlkds }jkj nsk dñk vkkdjj KkRk dhfTk, A 15½

Basic salary of Ghanshyam is Rs 12500 per month and D.A. is Rs. 6300 per month. He invests Rs. 2000 per month in G.P.F., Rs. 250 per month is G.I.S. and Rs. 69000 yearly as annual premium to L.I.C. and also Rs. 10000 yearly in post office L.I.C. premium. Calculate the income tax paid by him?

Rate of income tax :

upto Rs. 1,10,000	nil
From Rs. 1,10,001 to 1,50,000	10%
From Rs. 1,50,001 to 2,50,000	20%
above Rs. 2,50,000	30%

Educational cess : 3% of the total payable income tax and surcharge.

॥४॥ (OR)

'kkfYkukh dh okkf"kd v,k,k ॥१॥ fd j,k,k kk hkrrik NkMdj ॥1॥ 80]000 : lk,ks gA ,kfn okg LkKEKKU,k hkrfok" ,k fukf/k Eka lkfrkok"kd 40000 : lk,k\$ LkEkg Tkholuk CkhEkk ,kkTkuuk Eka 250 : lk,ks lkfrEkkkg Rkfkk 5000 v) lakkf"kd Tkholuk CkhEkk ikkfYkI h Eka fd'rk TkEkk djRkh gA Kkrk dhfTk, fd 'kkfYkukh dks vIkus v,k,kd j mLk fokukh,k ok"kd fdRkuuk v,k,kd j nikk gkukA

The annual income of Mrs. Shalini (Excluding HRA) is Rs. 180000. If she deposite Rs. 40000 per year in G.P.F., Rs. 250 per month in G.I.S. and Rs. 5000 half yearly premium towards L.I.C. Calculate her income tax payable in the financial year.

Rate of income tax :

upto Rs. 1,10,000	nil
From Rs. 1,10,001 to 1,50,000	10%
From Rs. 1,50,001 to 2,50,000	20%
above Rs. 2,50,000	30%

Educational cess : 3% of the total payable income tax and surcharge.

lkz uk 24 f \angle LMN dh jPkukk dhfTk, Tkgk MN = 5 LksEkh] \angle L = 55° vks L Lks Mkykk Xk,kk 'kh"kd Ykuk 3.5 LksEkh gkA jPkukk ds lkn Hkh fyk[k, A

Contruct $\triangle LMN$ in which $MN = 5$ cm., $\angle L = 55^\circ$ and perpendicular for L is 3.5 cm. Write steps of construction.

॥५॥ (OR)

, d Pkoh,k Pkrkdkd k ABCD dh jPkukk dhfTk, fTkLkEka \angle ABC = 90° vdk AC $\frac{3}{4}$ 6 LksEkh] AB $\frac{3}{4}$ 3 LksEkh] CD $\frac{3}{4}$ 3-6 LksEkh jPkukk ds lkn Hkh fyk[kA

Construct a cyclic quadrilateral ABCD in which $\angle ABC = 90^\circ$, $AC \frac{3}{4} 6$

cm., $AB = \frac{3}{4}$ 3 cm., $CD = \frac{3}{4}$ 3.6 cm. Write steps of construction.

Ikz Uk 25- fukeuk Lkkj . kh Lks Ekkf / kdk KkRk dhftk, & 15½

OkXkZ vBkj kYk	0&10	10&20	20&30	30&40	40&50
Ckkj Bkkj Rkk	4	8	10	11	16

Find the medium of the following table :

Class	0–10	10–20	20–30	30–40	40–50
Frequency	4	8	10	11	16

1/4 Fokk½ (OR)

fukeuk vkdfr c/u Lks cgyd KkRk dhftk, &

OkXkZ	0&10	10&20	20&30	30&40	40&50	50&60	60&70
Ckkj Bkkj Rkk	8	15	21	37	31	14	12

Find the mode of the following table :

Class	0–10	10–20	20–30	30–40	40–50	50–60	60–70
Frequency	8	15	21	37	31	14	12

Ikz Uk 26 , d Ok"kZ lkokZ fikRkk dh vk,kq lkjk dh vk,kq ds 8 Xkjh Fkh vkTk fikRkk dh vk,kq lkjk dh vk,kq ds OkXkZ ds Ckj kCkj gA Rkks mUkdh OkRkEkkUk vk,kq KkRk dhftk, \ 16½

One year ago, a man was 8 times as old as his son. Now his age is equal to the square of his son's age. Find their present ages.

1/4 Fokk½ (OR)

nks OEkXkRk LkEk Lkjk, ks KkRk dhftk, fTkUkds OkXkZ clk , kkjk 164 gA

The sum of squares of two consecutive even numbers is 164. Find the numbers.

Ik₂ Uk 27 fLk) dhfTk, fd fdLkh LkEkkgq f_{kk}HkTk dh fdLkh HkTk ds okXkZ ds frkXkHk mLkdh
ÅpkkbZ ds okXkZ ds Pkj Xkks ds Ckj kCkj gkk gk 16½

Prove that three times the square of any side of an equilateral triangle is equal to four times the square of the altitude.

1/4Fkokk½ (OR)

kfn PAB okUk dh Nnd jskk gks Tkks okUk dks A vks B lkj lkRkPNn djRkh gks vks PT , d Llk'kz jskk [k.M gks Rkks fLk) dhfTk, PA.PB = (PT)²

If PAB is a secant to a circle which intersecting the circle at A and B and PT is a tangent segment, then show that : $PA.PB = (PT)^2$

வகுகள் முக்கிய விஷயங்கள்

முக்கி 1

- (i) (b) 18
- (ii) (c) 45°
- (iii) (a) 2
- (iv) (d) 0.101
- (v) (b) 6

ஒத்துப்பாடு

- (i) 24
- (ii) 5
- (iii) 0
- (iv) $\cos\theta$
- (v) 10 | \sin

முக்கி 2 $\frac{x+1}{x-2} + \frac{x-1}{x-2}$

$$= \frac{x+1+x-1}{x-2} = \frac{2x}{x-2}$$

முக்கி 3 $15x^2 + x - 2 = 0$ என்ற குறுக்கு விடை

$$\alpha + \beta = -\frac{-b}{a} = \frac{1}{15}$$

$$\alpha \cdot \beta = \frac{c}{a} = \frac{-2}{15}$$

$$\begin{aligned}
 \text{मूल्य } 4 & \quad \frac{\cos ec 39^\circ}{\sec 75^\circ} \\
 &= \frac{\cos ec(90^\circ - 51^\circ)}{\sec 51^\circ} \\
 &= \frac{\sec 51^\circ}{\sec 51^\circ} \\
 &= 1
 \end{aligned}$$

मूल्य 5 फलना 1/2]3½ वक्ष ¼]1½ द्वारा किए गए निकाल

$$\begin{aligned}
 \text{परिवर्तन } (x_1, y_1) \text{ वक्ष } (x_2, y_2) \text{ द्वारा किए गए निकाल} \\
 &= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \\
 &= \sqrt{(4 - 2)^2 + (1 - 3)^2} \\
 &= \sqrt{(2)^2 + (-2)^2} \\
 &= \sqrt{4 + 4} \\
 &= \sqrt{8} = 2\sqrt{2}
 \end{aligned}$$

मूल्य 6 शंकु का वक्ष, क्षेत्रफल $\frac{1}{3}\pi r^2 h$

त्रिकोण का वक्ष $r = 7$ लम्बाई $h = 15$ लम्बाई

शंकु का वक्ष $\frac{1}{3}\pi r^2 h$

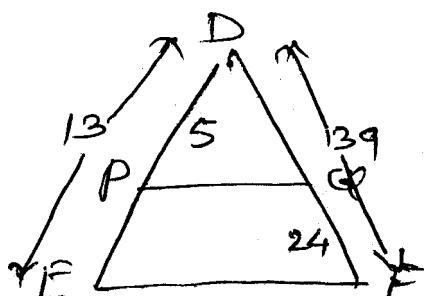
$$\frac{1}{3}\pi (7)^2 \cdot 15 = \frac{3}{4} \cdot 245\pi$$

मूल्य 7 फॉर्मूला $|S| = PE = DE - DP$

$$PE = 13 - 5 = 8 \text{ लम्बाई}$$

$$\frac{DE}{EP} = \frac{DF}{QF} \Rightarrow \frac{13}{39} = \frac{8}{24} \Rightarrow \frac{1}{3} = \frac{1}{3}$$

$$\therefore PQ \parallel EF$$



- mÙkj 8 $\sqrt{YXkkfj} \text{ FEk } ds fuk: lk.k ds lkdkj$
- (i) $Xk.khRkh,k lkRkhd \% \& Xk.khRkh,k lkRkhd Tkks/kuk] __.k] xqkk ds fy, \$] \times dk mlk,kkk fd,kk TkkRkk g\$$
- (ii) $fuk/kkj.k \sqrt{fkfnnVhdj.k lkRkhd \% fkfuké Pkjka alks alkbz fuk/kkj.Rk Ekkuk lknekuk djuks ds fyk, fuk/kkj.k lkRkhd (\leftarrow) dk lk,kkk fd,kk TkkRkk g\$}$
- (iii) $LkECKU/k Lkdkd lkRkhd \&$
 $lkRkhd \quad \sqrt{fuklk,k} \quad mnkgj.k$
 $< \quad Lks Nks/k \quad a < b \quad a Nks/k g\$ b Lks$

mÙkj 9 $I keku; fof/k \quad lkjd fof/k$

45 $\underline{& 15}$ <hr style="border-top: 1px solid black;"/> 30	45 $\underline{\$ 84}$ <hr style="border-top: 1px solid black;"/> 129 29 $\underline{\$ 1}$ <hr style="border-top: 1px solid black;"/> 30
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mÙkj 9
$$\begin{aligned} \frac{R}{S} &= \left(\frac{x^3+1}{x-1} \right) / \left(\frac{x^2-x+1}{x+1} \right) \\ &= \frac{(x+1)(x^2-x+1)}{x-1} \times \frac{x+1}{(x^2-x+1)} \\ &= \frac{(x+1)^2}{(x-1)} \end{aligned}$$

mÙkj 10 $fn,kk g\$ \quad \frac{a}{b} = \frac{c}{d} \quad(i)$

$$\begin{aligned}
 &= \frac{a}{c} = \frac{b}{d} && \text{1/4, d k u r k j k u k l k k R k L k } \\
 &= \frac{a+c}{c} = \frac{b+d}{d} && \text{1/3 k k k k k k k k R k L k } \\
 &= \frac{a+c}{b+d} = \frac{c}{d} && \dots\dots\dots \text{(ii) 1/4, d k u r k j k u k l k k R k L k }
 \end{aligned}$$

| ehdj .k (i) , 0a(ii) | s

$$\frac{a}{b} = \frac{a+c}{b+d}$$

mUlkj 12 Ekkukk 302 Js kh 3]8]13] &&&&&& dk n Okka lkn gA

$$T_n = 302, a = 3, d = 8 - 3 = 5, n = ?$$

$$n \text{ Okka in } T_n = a + (n - 1) d$$

$$302 = 3 + (n - 1) 5$$

$$302 = 3 + 5n - 5$$

$$302 - 3 + 5 = 5n$$

$$304 = 5n$$

$$n = \frac{304}{5}$$

$\frac{304}{5}$ i wklv l q; k ughag%vr% 302 Js kh dk dk b7 in ughagA

$$mUlkj 13 C; kt \frac{3}{4} \frac{\text{ekfI d tek} \times \text{nJ}}{100} \times \frac{\text{ekg } \frac{1}{4}\text{ekg } \$ 1\frac{1}{2}}{24}$$

$$= \frac{100 \times 11}{100 \times 2} \times \frac{24(24+1)}{24}$$

$$= \frac{11}{2} \times 25 = \frac{275}{2} = 137.5 \#.$$

$$\text{feJ/ku } \frac{3}{4} \quad 100 \times 24 + 137.5 = 2400 + 137.5 = 2537.5 \#.$$

mUlkj 14 L.H.S. = $\sin^4 \theta + \cos^4 \theta$

$$= (\sin^2 \theta)^2 + (\cos^2 \theta)^2$$

$$= (\sin^2 \theta)^2 + (\cos^2 \theta)^2 + 2\sin^2 \theta \cos^2 \theta - 2\sin^2 \theta \cos^2 \theta$$

$$= (\sin^2 \theta + \cos^2 \theta)^2 - 2\sin^2 \theta \cos^2 \theta$$

$$= 1 - 2\sin^2 \theta \cos^2 \theta \quad \text{R.H.S.}$$

mUlkj 15 Xkkks dh 0, kklk $\frac{3}{4}$ 6 LksEkh-
fikT, kk $\frac{3}{4}$ 3 LkEkh-

$$\text{Xkkks dk } \sqrt{k, kRkuk} \quad \frac{3}{4} \quad \frac{4}{3}\pi r^3$$

$$\frac{3}{4} \quad \frac{4}{3}\pi (3)^3 \quad \frac{3}{4} \quad 36\pi \quad ?kuk \quad LkEkh$$

$$\text{vr% Xkkks dk } \sqrt{k, kRkuk} \quad 36\pi \quad ?kuk \quad LkEkh \quad gkkka$$

mUlkj 16 | # %fcUnq(x₁, y₁), (x₂, y₂) vkg (x₃, y₃) | ejsk gsrksf=Hkt dk {ksQy 'k; gkska

$$\Delta dk \{ksQy \frac{1}{4} [x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)] = 0$$

$$\text{vr% fcUnq[1] 4, 1a] & 2, 1a] vkg 1&3] 16, 1 | ejsk gks ; fn$$

$$\Rightarrow 1[(-2 - 16) + \{a(16 - 4) + (-3)\}(4 - (-2)) = 0$$

$$\Rightarrow -18 + a(12) - 3(4 + 2) = 0$$

$$\Rightarrow -18 + 12a - 18 = 0$$

$$\Rightarrow 12a - 36 = 0$$

$$\Rightarrow a = 3$$

1/4 Fokalk/

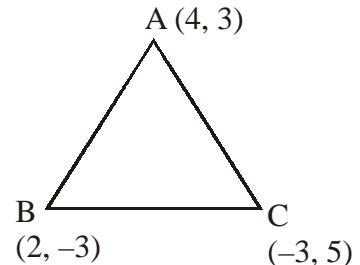
mÜkj 16 ABC, d Δ gftl ds 'k' kds funkd Øe'k% $(x_1, y_1) = (4, 3)$, $(x_2, y_2) = (2, -3)$, $(x_3, y_3) = (-3, 5)$,

$$f=Hk\text{t} dk d\text{ind } (h, k) = \left(\frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3} \right)$$

$$h = \frac{x_1 + x_2 + x_3}{3} = \frac{4 + 2 + (-3)}{3} = \frac{3}{3} = 1$$

$$k = \frac{y_1 + y_2 + y_3}{3} = \frac{3 + (-3) + 5}{3} = \frac{5}{3}$$

$$k = \frac{3 - 3 + 5}{3} = \frac{5}{3}$$



$$\text{dæd } \frac{3}{4} \left(1, \frac{5}{3} \right) \text{ gkskA}$$

mÜkj 17 eku fy; k fd f=Hk\text{t} ds dks k $(\alpha - \delta)^\circ, \alpha^\circ, (\alpha + \delta)^\circ$ gA 1/4

f=Hk\text{t} ds rhukadks k dh eki 180° gA

$$\Rightarrow (\alpha - \delta)^\circ + \alpha^\circ + (\alpha + \delta)^\circ = 180^\circ \Rightarrow 3\alpha = 180^\circ \Rightarrow \alpha = 60^\circ$$

$$vr\% l cl scMk dks k 105^\circ gA \alpha + \delta = 105^\circ \Rightarrow 60^\circ + \delta = 105^\circ \Rightarrow \delta = 45^\circ$$

$$l cl sNks k dks k (\alpha - \delta)^\circ \Rightarrow \alpha - \delta = 60^\circ - 45^\circ = 15^\circ$$

$$15^\circ = \frac{\pi}{180} \times 15 = \frac{\pi}{12}$$

$$chp dks k = 60^\circ = \frac{\pi}{180} \times 60 = \frac{\pi}{3}$$

$$l cl scMk dks k = 105^\circ = \frac{\pi}{180} \times 105 = \frac{7\pi}{12}$$

$$vHk\text{t} V dks k \frac{\pi}{12}, \frac{\pi}{3}, \text{ or } \frac{7\pi}{12} j fM; u gA$$

1/4 Fokalk/

ekuk f=Hk\text{t} ds dks k $\angle A, \angle B, \angle C$ gA

itukud kj $\angle A : \angle B : \angle C = 2 : 3 : 4$

ekuk dkbz dksk x gsrk ge tkurs gfd $\angle A + \angle B + \angle C = 180^\circ$

$$\therefore \angle A = 2x, \angle B = 3x, \angle C = 4x$$

$$vr\% \quad 2x + 3x + 4x = 180^\circ$$

$$\Rightarrow 9x = 180^\circ$$

$$\Rightarrow x = 20^\circ$$

$$vr\% \quad \angle A = 2x = 2 \times 20^\circ = 40^\circ = 40^\circ \times \frac{\pi}{180} = \frac{2\pi}{9} \text{ jSM; u}$$

$$\angle B = 3x = 3 \times 20^\circ = 60^\circ = 60^\circ \times \frac{\pi}{180} = \frac{\pi}{3} \text{ jSM; u}$$

$$\angle C = 4x = 4 \times 20^\circ = 80^\circ = 80^\circ \times \frac{\pi}{180} = \frac{4\pi}{18} \text{ jSM; u}$$

vr% f=Hkt ds dksk $40^\circ, 60^\circ, 80^\circ$ gftuds jSM; u eku Øe'k% $\frac{2\pi}{9}, \frac{\pi}{3}, \frac{4\pi}{18}$ gA

mÙkj 18 $x = a \sec \theta$ Rkfkk $y = b \tan \theta$ 14%

$$\frac{x}{a} = \sec \theta \quad \text{(i)} \quad Rkfkk \quad \frac{y}{b} = \tan \theta \quad \text{(ii)}$$

I eh (i) o (ii) dk oxldjds (i) I s(ii) dks?kvkus ij

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = \sec^2 \theta - \tan^2 \theta \quad \begin{cases} \because 1 + \tan^2 \theta = \sec^2 \theta \\ 1 = \sec^2 \theta - \tan^2 \theta \end{cases}$$

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1.$$

14Fkdk1/2

fn; k gS $x = a \cos \theta - b \sin \theta$ ----- 11%

Rkfkk $y = a \sin \theta + b \cos \theta$ ----- 12%

I eh dj.k 11% o 12% dks oxldjds tkus ij

$$x^2 + y^2 = a^2 (\cos^2 \theta + \sin^2 \theta) + b^2 (\cos^2 \theta + \sin^2 \theta) \\ - 2ab \cos \theta \sin \theta + 2ab \sin \theta \cos \theta$$

$$x^2 + y^2 = a^2 + b^2 \quad \begin{cases} \because \sin^2 \theta + \cos^2 \theta = 1 \end{cases}$$

mÙkj 19 ?ku l s d k v s x; s c M & l s c M & ' k d q d k v k; r u V = $\frac{1}{3}\pi r^2 h$ 14½

f n; k g\\$ h = 3 l seh
 ' k d q d s v k / k j d k 0; k l = 2r = 3 l seh

$$r = \frac{3}{2} l seh$$

$$\text{eku j [kus i j]} \quad V = \frac{1}{3}\pi \left(\frac{3}{2}\right)^2 \cdot 3 = \frac{9}{4}\pi$$

$$V = 2.25\pi ?ku l seh$$

$$\frac{1}{4}\sqrt{Fk0k1/2}$$

ekuk x ksys dh f=T; k = r

f n; k g\\$ x ksys dk i "Bh; {k & Qy = 616 oxl l seh

$$\Rightarrow 4\pi r^2 = 616 \Rightarrow 4 \times \frac{22}{7} \times r^2 = 616 \Rightarrow r^2 = \frac{7 \times 616}{4 \times 22}$$

$$\Rightarrow r^2 = 7 \times 7 \Rightarrow r = 7 l seh$$

$$\therefore x ksys dk v k; r u = \frac{4}{3}\pi r^3 = \frac{4}{3} \times \pi \times (7)^3$$

$$= \frac{4}{3} \times \pi \times 7 \times 7 \times 7$$

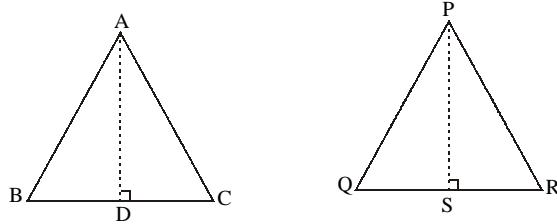
$$= \frac{1372}{3}\pi ?ku l seh$$

mÙkj 20- i eš dFku % nks l e: i f k k k Q Y k d k v k k k R k f d u g h a n k s L k k R k
 H k T k k v k d s o k k k d s v k k k R k d s c k j k c k j g k k k g A 14½

Kkr g\\$% nks l e: i f = H k t ABC v k PQR

$$f l) d j u k g \$ \% \quad \frac{\{k & k Q y \Delta ABC}{\{k & k Q y \Delta PQR} = \frac{AB^2}{PQ^2} = \frac{BC^2}{QR^2} = \frac{AC^2}{PR^2}$$

jpuuk % $\Delta ABC \sim \Delta PQR$



mifuk %

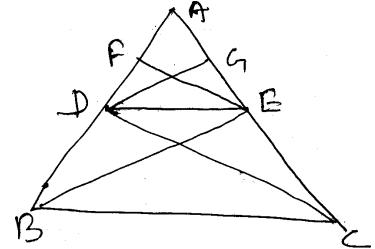
dFku	dkj.k
$\frac{\text{Qy } \Delta ABC}{\text{Qy } \Delta PQR} = \frac{\frac{1}{2} BC \times AD}{\frac{1}{2} QR \times PS}$ $\frac{\text{Qy } \Delta ABC}{\text{Qy } \Delta PQR} = \frac{BC}{QR} \times \frac{AD}{PS} \quad \dots \text{(i)}$ <p>$\forall C f = Hkt \Delta ADB \vee f = Hkt \Delta PSQ$</p> $\angle B = \angle Q$ $\angle ADB = \angle PSQ$ $\Delta ADB \sim \Delta PSQ$ $\frac{AD}{PS} = \frac{AB}{PQ} \quad \dots \text{(ii)}$ $yfdu \frac{AB}{PQ} = \frac{BC}{QR} \quad \dots \text{(iii)}$ $\therefore \frac{AD}{PS} = \frac{BC}{PQ} \quad \dots \text{(iv)}$ $\frac{\text{Qy } \Delta ABC}{\text{Qy } \Delta PQR} = \frac{BC}{QR} \times \frac{BC}{QR} = \frac{BC^2}{QR^2}$ <p>b1 i dkj fl) dj l drsgifd</p> $\frac{\text{Qy } \Delta ABC}{\text{Qy } \Delta PQR} = \frac{AB^2}{PQ^2}$ $\forall f \frac{\text{Qy } \Delta ABC}{\text{Qy } \Delta PQR} = \frac{AC^2}{PR^2}$ $\forall Fkkf \sim \frac{\text{Qy } \Delta ABC}{\text{Qy } \Delta PQR} = \frac{AB^2}{PQ^2} = \frac{BC^2}{QR^2} = \frac{AC^2}{PR^2}$	<p>le: i Δ ds l xr dks k cjk cj gA iR; d 90° jpuuk l s h AA le: irk mi es l s</p> <p>le: i Δ dh l xr Hkt k; s l ekuj kfrd gksh gA</p> <p>$\Delta ABC \sim \Delta PQR$</p> <p>(ii) O (iii) l s</p> <p>(i) O (iv) l s</p> <p>bfr fl) e</p>

$\frac{1}{2} \sqrt{FkOkk}$

F₁ & L₁ k₁ E₁ & , d f=H₁ t₁ d₁ , d H₁ t₁ d₁ l e₁ r₁ [k₁ p₁ x b₁ z j₁ k₁ v₁ ; n₁ s₁ H₁ t₁ k₁ v₁ d₁ k₁ s₁ t₁ u₁ n₁ s₁ f₁ c₁ n₁ k₁ i₁ j₁ i₁ f₁ P₁ N₁ d₁ r₁ g₁ S₁ f₁ c₁ n₁ H₁ t₁ k₁ v₁ d₁ k₁ s₁ l₁ e₁ u₁ v₁ q₁ k₁ r₁ e₁ f₁ H₁ D₁ r₁ g₁ A₁

K₁ r₁ g₁ % $\Delta f=H_1 t_1$ ABC e₁ DE||BC

$$f\% = \frac{dju_k g\%}{AD} = \frac{AE}{EC}$$



jpu_k % (i) B dks E l s rFkk C dks D l s feyk; kA

(ii) EF \perp AB [k₁ p₁ A]

(iii) DG \perp AE [k₁ p₁ A]

mi i f₁ %

dFku	dkj.k
$\Delta dk \{k=Qy \frac{1}{4} \frac{1}{2} \sqrt{k/kj} \times Apkbz}$ $\frac{\Delta ADE dk \{k=Qy}{\Delta BDE dk \{k=Qy} = \frac{\frac{1}{2} AD.EF}{\frac{1}{2} BD.EF} = \frac{AD}{BD} \dots (i)}$ bl h i dkj] $\frac{\Delta ADE dk \{k=Qy}{\Delta CDE dk \{k=Qy} = \frac{\frac{1}{2} AE.DG}{\frac{1}{2} EC.DG} = \frac{AE}{EC} \dots (ii)}$ yfdu] $\Delta BDE dk \{k=Qy \frac{1}{4}$ $\Delta CDE dk \{k=Qy \dots (iii)$ $vr\% = \frac{AD}{BD} = \frac{AE}{EC}$	$, d gh \sqrt{k/kj} \sqrt{k}, d gh l ekrj$ $j \{k v k a d s c h p c u s f=H_1 t_1 dk$ $\{k=Qy c j k c j g k r k g A$ (i), (ii), (iii) l s bfr fl) e

mUkj 21- F₁ & L₁ k₁ E₁ x n₁ k₁ d₁ dy l a ; k 4 \$ 5 \$ 7 $\frac{3}{4}$ 16

$$n(S) = 16$$

(i) 7 | Qn xñkaeñl sñdkbl, d | Qn xñ fudkyh tk l drh gñ

$$n(A) = 7$$

$$\text{vr% LkQn xñ fudkyus dh iñf; drk} \quad P(A) = \frac{n(A)}{n(S)}$$

$$P(A) = \frac{7}{16}$$

(ii) LkQn ,kk dkyh xñ fudkyus dh iñf; drk

$$P(A) = \frac{7}{16} + \frac{4}{16}$$

$$\frac{7+4}{16} \quad \frac{11}{16}$$

14/20k½

dy | EHkkfor ?kVuk; n(S) ¾ 52

(i) iku dk rk'k fudkyus dh ?kVuk A gks rks

$$n(A) \frac{3}{4} 13$$

$$P(A) = \frac{n(A)}{n(S)} \frac{3}{4} \frac{13}{52} = \frac{1}{4}$$

(ii) iku ; k bñ dk bDdk fudkyus dh ?kVuk A gks rks

$$n(A) \frac{3}{4} 1 + 1 = 2$$

$$P(A) = \frac{n(A)}{n(S)} \frac{2}{52} = \frac{1}{26}$$

$$\text{mÙkj } 22 \quad \text{fn,kk gS } x = \frac{3ab}{a+b} \quad 15\%$$

$$\text{vr% } \frac{x}{3a} = \frac{b}{a+b}$$

2 dk xqkk djus ij

$$\frac{2x}{3a} = \frac{2b}{a+b}$$

$$\frac{3b+a}{b-a} + \frac{3a+b}{-(b-a)} \quad , \text{kkkkkkj kkkkkk fuk, kEk Lks}$$

$$\frac{2x+3a}{2x-3a} = \frac{3b+a}{b-a} \quad \dots \dots \dots \quad (1)$$

rFkk i p%

$$\frac{x}{3b} = \frac{a}{a+b}$$

2 dk xqkk djus ij

$$\frac{2x}{3b} = \frac{2a}{a+b}$$

$$\frac{2x+3b}{2x-3b} = \frac{2a+(a+b)}{2a-(a+b)} \quad , \text{kkkkkkj kkkkkk fuk, kEk Lks}$$

$$\frac{2x+3b}{2x-3b} = \frac{3a+b}{a-b} = \frac{3a+b}{-(b-a)} \quad \dots \dots \dots \quad (2)$$

LkEkhadj . k 1/1 RkFkk 1/2 dks TkkMoks lkj

$$\Rightarrow \frac{2x+3a}{2x-3a} + \frac{2x+3b}{2x-3b} = \frac{3b+a}{b-a} + \frac{3a+b}{-(b-a)}$$

$$\frac{3b+a-3a-b}{b-a}$$

$$\frac{2(b-a)}{b-a}$$

$$2$$

1/4 Fkk 1/2

i Fke LkEkhadj Jskh ds fy, a=1, d=1

$$S_1 = \frac{n}{2} [2 \times 1 + (n-1) \times 1]$$

$$S_1 = \frac{n}{2} [2 + n - 1]$$

$$S_1 = \frac{n}{2}[n+1]$$

f}rh; LkEkkukkjk Js kh ds fy, a=2, d=3

$$S_2 = \frac{n}{2}[2 \times 2 + (n-1) \times 3]$$

$$S_2 = \frac{n}{2}[4 + 3n - 3]$$

$$S_2 = \frac{n}{2}[3n + 1]$$

rrh; LkEkkukkjk Js kh ds fy, a=3, d=5

$$S_3 = \frac{n}{2}[2 \times 3 + (n-1) \times 5]$$

$$S_3 = \frac{n}{2}[6 + 5n - 5]$$

$$S_3 = \frac{n}{2}[5n + 1]$$

iEke] f}rh; , oarrh; I ekUrj Jf.k; kdk ; kx

$$S_1 + S_2 + S_3 = \frac{n}{2}[n+1] + \frac{n}{2}[3n+1] + \frac{n}{2}[5n+1]$$

$$= \frac{n}{2}[n+1 + 3n+1 + 5n+1]$$

$$= \frac{n}{2}[9n+3]$$

$$= \frac{3n}{2}[n+1]$$

$$= \frac{3}{2}(3n+1)n$$

mUkj 23 ?ku'; ke dh okf"kd v{k;

15%

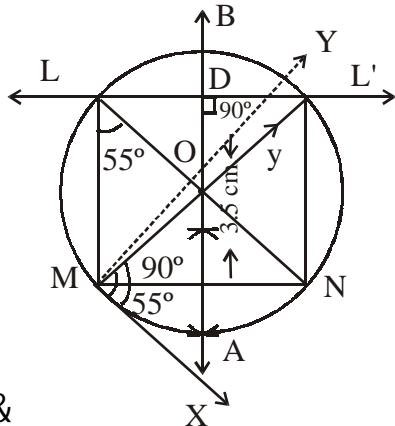
1.	ey oru	$12500 \times 12 \text{ ekg } \frac{3}{4} 15000 : -$
	egxkbz HkYkk	$6300 \times 12 \text{ ekg } \frac{3}{4} 75600 : -$

	vr% dy okf"kd vk; 3/4 2]25]600 : -		
2-	dj eNV ; k; jkf'k	okf"kd	
	1/2 okf"kd I kekU; Hkfo"; fuf/k eav'knku	2000 x 12 3/4 24]000 : -	
	1/2 th vkbz , I okf"kd iife; e	250 x 12 3/4 3]000 : -	
	1/2 okf"kd thou chek iife; e	3/4 69]000 : -	
	1/2 okf"kd Mkd thou chek iife; e	3/4 10]000 : -	
	dj eNV ; k; jkf'k 1/2 a + b + c + d		
	24]000 \$ 3]000 \$ 69]000 \$ 10]000 3/4 1]06]000 : -		
	ijUrqvfv/kdre NV ; k; jkf'k 1]00]000 : - rd I hfer gA		
	rc dj eNV ; k; jkf'k 3/4 1]00]000 : -		
3-	dj ; k; vk; 2]25]600 : - & 1]00]000 : - 3/4 1]25]600 : -		
4-	vk; dj 3/4 1]25]600 & 1]10]000 3/4 15600 dk 10%		
	3/4 15,600 x $\frac{10}{100}$	3/4 1560 : -	
5-	f'k{k midj 3/4 1560 rd 3%		
	3/4 15,60 x $\frac{10}{100}$ 3/446-80	3/4 47 : -	
6-	ns dy vk; dj 3/4 1560 \$ 47 3/4 1607 : -		
	vr% ?ku'; ke }kjk dy ns vk; dj 3/4 1607 : -		
	1/4 Fk0k1/2		
mUkj 23	'kkfyuh dh okf"kd vk;		
1-	dfork dh dy okf"kd vk;	3/4 1]80]000 : -	
2-	dj eNV ; k; jkf'k		
	1/2 okf"kd I kekU; Hkfo"; fuf/k eav'knku	3/4 40]000 : -	
	1/2 okf"kd I eg thou chek iife; e	250 x 12 3/4 3]000 : -	
	dj eNV ; k; jkf'k 1/2 3/4 40]000 \$ 3]000 \$ 10]000 3/4 53]000 : -		

i jUrqvfv/kdre NW ; kx; jkf'k 1]00]000 : - rd I hfer gA

- 3- dj ; k; j kf'k ¾ 1]80]000 : - & 53]000 : - ¾ 1]27]000 : -
4- v;k; dj ¾ 1]27]000 : - rd dkblz dj ughA
vr% 'kkfyuh dks dkblz dj ughanuk i MekA

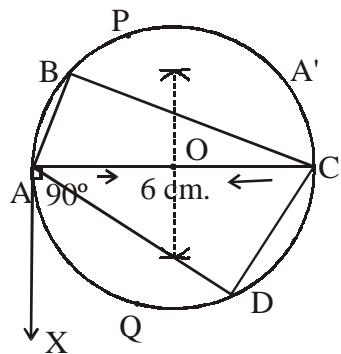
mÙkj 24



j puk ds i n %

1/4 Fkokk 1/2

mÙkj 24



jpuk ds i n %

mÙkj 25-

15½

dkkz vkkjkYk	0&10	10&20	20&30	30&40	40&50	; kx
Ckkj &kkj Rkk	4	8	10	11	16	49
I p; h ckjæjrk	4	12	22	33	49	

i nkad h I ð; k N ¾ 49 rc

ef/; dk I ð; k ¾ $\frac{N}{2}$ ¾ 24-5

tksfd I p; h ckjæjrk 33 dsvrxt vkrk gA

ef/; dk oxz 30&40

ef/; dk oxz dh fuEu I hek ¾ 30

ef/; dk oxz dh mPp I hek ¾ 40

ef/; dk oxz dh vkoFr ¾ 11

ef/; dk oxz dsBhd i gys dh I p; h vkoFr ¾ 22

$$\text{ef/; dk } \frac{(m-c)(L_2 - L_1)}{f}$$

$$\frac{3}{4} 30 + \frac{(24.5 - 22)(40 - 30)}{11} = 30 + \frac{2.5 \times 10}{11}$$

$$\frac{3}{4} 30 + \frac{25}{11} = 30 + 2.27$$

ef/; dk $\frac{3}{4}$ 32.27

$\frac{1}{4} \sqrt{F_k} dk \frac{1}{2}$

dk	0&10	10&20	20&30	30&40	40&50	50&60	60&70
Ckj &kkj Rkk	8	15	21	37	31	14	12

I kj.kh I s Li "V gSfd I cl svf/kd ckj & jrk 37 gS tks oxl 30&40 dh ga

vr%cgjd oxl 30&40

cgjd oxl dh fuEu I hek $\frac{3}{4}$ 30

cgjd oxl dh mPp I hek $\frac{3}{4}$ 40

$$f_1 = 37, \quad f_0 = 21, \quad f_2 = 31$$

cgjd

$$\frac{3}{4} L_1 + \frac{f_1 - f_0}{2f_1 - f_0 - f_2} (L_2 - L_1)$$

$$\frac{3}{4} 30 + \frac{37 - 21}{2 \times 37 - 21 - 31} (40 - 30) = 30 + \frac{16}{74 - 52} \times 10$$

$$\frac{3}{4} 30 + \frac{160}{22} = 30 + \frac{80}{11} = 30 + 7.27$$

$$\frac{3}{4} 37.27$$

mūkj 26 ekuk flkRkk dh oržku vč, kq x o"kl včs lkčk dh oržku vč, kq y o"kl gSgA ½½
 1 o"kl i nž fir k dh vč; q¾ (x -1) o"kl
 1 o"kl i nž i ¶ dh vč; q¾ (y -1) o"kl
 i ž ukud kj] i Eke 'krž l §

$$(x - 1) = (y - 1) \cdot 8$$

$$x - 1 = 8y - 8$$

$$x - 8y = -8 + 1$$

$$x - 8y = -7$$

f}rh; 'krz | s

I eh- (i) I sx dk eku j [kus i j

$$8y - 7 = y^2$$

$$\Rightarrow y^2 - 8y + 7 = 0$$

$$\Rightarrow y^2 - y - 7y + 7 = 0$$

$$\Rightarrow y(y - 1) - 7(y - 1) = 0$$

$$\Rightarrow (y - 1)(y - 7) = 0$$

$$\Rightarrow (y-1) = 0 ; \text{ } \& \text{ } (y-7) = 0 \quad \Rightarrow \quad y = 1 ; \text{ } \& \text{ } y = 7$$

D; kfd firk] i ≠ dh vk; qcjkcj ughagks l drh vr%fir k dh vk; q49 o"kl vkg
i ≠ dh vk; q7 o"kl gA

1/2

eku i gyh le lq; k x, nijh Øekxr le lq; k (x + 2) gA

$$itukud kj \quad x^2 + (x + 2)^2 = 164$$

$$\Rightarrow x^2 + x^2 + 4x + 4 = 164$$

$$\Rightarrow 2x^2 + 4x + 4 = 164$$

$$\Rightarrow 2(x^2 + 2x + 2) = 164$$

$$\Rightarrow x^2 + 2x + 2 - 82 = 0$$

$$\Rightarrow x^2 + 2x - 80 = 0$$

$$\Rightarrow x^2 - 8x + 10x - 80 = 0$$

$$\Rightarrow x(x - 8) + 10(x - 8) = 0$$

$$\Rightarrow (x - 8)(x + 10) = 0$$

$$x - 8 = 0 ; k x + 10 = 0$$

$$x = 8 ; k x = -10$$

x dk eku ___. kRed ughagks l drk] vr% x = 8

$$\therefore nijh dekxr lq; k, ags(x + 2) = 8 + 2 = 10$$

vr% vHkh"V lq; k, j 8, 10 gkshA

mÙkj 27 fn; k gS% LkEkkkgq ΔABC ft l dh Åpkbl AD gA

16½

$$fl) djuk gS: 3BC^2 = 4AD^2$$

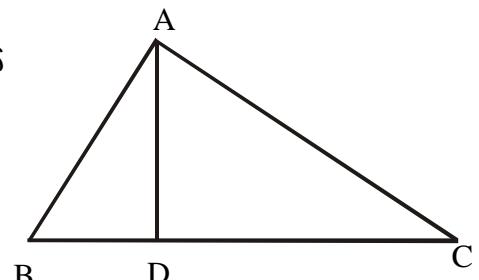
mi i fRr % ΔABC eB AB = BC = AC

$$vksj AD \perp BC, BD = CD = \frac{BC}{2} \quad(i)$$

I edksk ΔABD eB i kbFkkxkj l i es ls

$$\Rightarrow AB^2 = AD^2 + BD^2$$

$$\Rightarrow AB^2 = AD^2 + \left(\frac{BC}{2}\right)^2$$



$$\Rightarrow AB^2 = AD^2 + \frac{BC^2}{4}$$

$$\Rightarrow BC^2 = AD^2 + \frac{BC^2}{4} \quad (\because AB = BC)$$

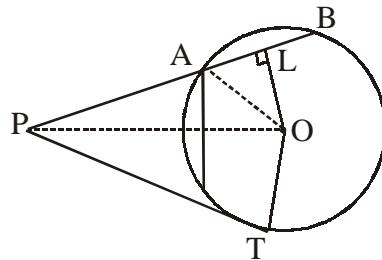
$$\Rightarrow BC^2 - \frac{BC^2}{4} = AD^2$$

$$\Rightarrow 4BC^2 - BC^2 = 4AD^2$$

$$\Rightarrow 3BC^2 = 4AD^2 \quad \text{f1) gvkA}$$

1/4 Fk0k1/2

mukj 27 fn; k gs C(O, r) gs PAB Nnd jskk rFkk PT Li 'kz jskk ga



$$\text{f1) djuk gs \% PA.PB} = (PT)^2$$

jpu k % OL \perp AB [kpk A OA, OP vks OT dksfeyk; k

$$\begin{aligned} \text{mi i fkr \% PA.PB} &= (PL - AL)(PL + LB) \\ &= (PL - AL)(PL + AL) \quad (\because AL = LB) \\ &= PL^2 - AL^2 \\ &= (OP^2 - OL^2) - AL^2 \end{aligned}$$

$$\therefore \text{ledksk } \Delta PLO \text{ ei } OP^2 = OL^2 + PL^2.$$

$$= OP^2 - OL^2 - AL^2$$

$$= OP^2 - (OL^2 + AL^2)$$

$$= \text{OP}^2 - \text{OA}^2$$

$$\therefore \text{ledksk } \Delta \text{ALO es OA}^2 = \text{OL}^2 + \text{AL}^2.$$

$$= \text{OP}^2 - \text{OT}^2$$

$$= \text{PT}^2$$

$$\therefore \text{ledksk } \Delta \text{PTO es OP}^2 = \text{PT}^2 + \text{OP}^2.$$

$$\text{PA.PB} = \text{PT}^2$$