माध्यमिक शिक्षा मण्डल, मध्यप्रदेश, भोपाल

24 पृष्ठीय

परीक्षार्थी द्वारा भरा जायें ↓

परीक्षा का विषय	विषय कोड			परीक्षा का माध्यम
MATHEMATICS	1	0	0	ENGLISH

स्टीकर तीर के निशान ↓ से मिलाकर लगायें

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परीक्षार्थी का रोल नम्बर

अंकों में

1	2	3	2	3	5	9	8	8

शब्दों में

one	Two	Three	Two	Three	Five	NINE	Eight	Eight

नीचे दिये गये उदाहरण अनुसार रोल नम्बर भरें।

उदाहरणार्थ								
1	1	2	4	3	9	5	6	8
एक	एक	दो	चार	तीन	नौ	पाँच	छः	आठ

क – पूरक उत्तर पुस्तिकाओं की संख्या अंको में 01 शब्दों में one

ख – परीक्षार्थी का कक्ष क्रमांक 01

ग – परीक्षा की दिनांक 22 02 22

परीक्षा का नाम एवं परीक्षा केन्द्र क्रमांक की मुद्रा

हाई स्कूल परीक्षा केन्द्र क्रमांक-321048

पर्यवेक्षक का नाम एवं हस्ताक्षर	केन्द्राध्यक्ष/सहायक केन्द्राध्यक्ष के हस्ताक्षर
	Pathak

परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जायें ↓

प्रमाणित किया जाता है कि मूल्यांकन के समय पूरक उत्तर पुस्तिकाओं की संख्या उपरोक्तनुसार सही पाई होलो क्राफ्ट स्टीकर क्षतिग्रस्त नहीं पाया गया अन्दर के पृष्ठों के अनुरुप मुख्य पृष्ठ पर अंकों की प्रविष्टी अंकों का योग सही है।
निर्धारित मुद्रा : नाम, पदनाम, मोबाईल नम्बर, परीक्षक क्रमांक एवं पदाकिंत संस्था के नाम की मुद्रा लगाएं।

उप मुख्य परीक्षक के हस्ताक्षर एवं निर्धारित मुद्रा	परीक्षक के हस्ताक्षर एवं निर्धारित मुद्रा
M. D. RAO CWA20220515	Wamanrao Thakre V.N.-22567

नोट :– "हायर सेकेन्डरी परीक्षा में केवल वाणिज्य संकाय के विषयों तथा हाईस्कूल परीक्षा में प्रायोगिक विषय को छोड़कर शेष विषयों हेतु नियमित एवं स्वाध्यायी छात्रों के लिये प्रश्न पत्र 100 अंकों का होगा किन्तु नियमित छात्रों को 100 अंक के प्राप्तांक का 80% अधिभार एवं स्वाध्यायी छात्रों को 100 अंक के प्राप्तांक ही अंकसूची में प्रदर्शित किये जायेंगे।"

केवल परीक्षक द्वारा भरा जायें

प्रश्न क्रमांक के सम्मुख प्राप्तांकों की प्रविष्टी करें

प्रश्न क्रमांक	पृष्ठ क्रमांक	प्राप्तांक (अंको में)
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विशेष नोट :– सिलाई खुली हुई अथवा क्षतिग्रस्त उत्तर पुस्तिका को न तो पर्यवेक्षक वितरण करे और न ही छात्र उपयोग में लें। ऐसी उत्तर पुस्तिका में लिखे उत्तरों का मूल्यांकन नहीं किया जायेगा।

परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जायें → केन्द्राध्यक्ष/सहायक केन्द्राध्यक्ष एवं पर्यवेक्षक द्वारा भरा जायें → परीक्षार्थी द्वारा भरा जायें →

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Ans

÷ Solution of Que 1 ÷

i) ~~b.)~~ c.) 13

ii) b.) has no solution

iii) c.) $-b/a$

iv) c.) 0

v) a.) 1

vi) b.) $5\sqrt{2}$

÷ Solution of Que-2 ÷

i) $a \times b$

ii) 5

iii) Cubic

iv) $a+(n-1)d$

(V) Similar

(Vi) Secant

(Vii) πr^2

6

7

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Solution of Que-3 :-

A		B
(i)	$\sec(90-\theta)$	d.) $\mathrm{cosec}\,\theta$
(ii)	$\cos\theta$	c.) $1/\sec\theta$
(iii)	$\sin 0^\circ$	b.) 0
(iv)	$\cos 0^\circ$	a.) 1
(v)	$\sqrt{1+\tan^2\theta}$	f.) $\sec\theta$
(vi)	$\sqrt{1-\cos^2\theta}$	e.) $\sin\theta$

Solution of Que-5 :-

(i) True

(ii) True

(iii) False

(iv) False

(v) False

(vi) True

Solution of Que - 4

(i) b is a factor of a.

(ii) ~~$ax^2 + bx + c$~~

$p(x) = ax^2 + bx + c$

(iii) "Pythagoras theorem": In a right triangle square of hypotenus is equal to sum of square of other two sides.

(iv.) $\sqrt{x^2 + y^2}$

(v.) Modal class

(vi.) Zero (0)

(vii.) one (1)

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Solution of Que -6

Let a be any positive integer and $b = 2$.

then, according to Euclid's division lemma

$$a = bq + r \quad , \quad 0 \le r < b$$
$$\Rightarrow a = 2q + r \quad , \quad 0 \le r < 2 \quad \text{——— (1)}$$

so, possible values of $r = 0, 1$.
on putting values of r in (1),

$$a = 2q + 0$$
$$= 2q \quad \text{(even)}$$

and

$$a = 2q + 1 \quad \text{(odd)}$$

If a is in form of $2q$ then, a is even integer as it is divisible by 2.
Also, a positive integer is either odd or even.

Hence, every positive even integer is of form $2q$ and that every positive odd integer is of the form $2q+1$.

Hence, proved.

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~~An~~ Solution of Q-7 (Or)

Let α and β be the zeros of quadratic polynomial $p(x) = ax^2 + bx + c$.

then, As per given question

$$\alpha + \beta = 1 \quad [\text{Given}]$$

$$\Rightarrow \frac{-b}{a} = 1 \quad \left[\because \alpha+\beta = \frac{-b}{a}\right]$$

$$\Rightarrow \frac{b}{a} = \frac{-1}{1} \quad \text{—— (1)}$$

and

$$\alpha \cdot \beta = 1 \quad [\text{Given}]$$

$$\Rightarrow \frac{c}{a} = \frac{1}{1} \quad \text{—— (2)} \quad \left[\because \alpha \cdot \beta = \frac{c}{a}\right]$$

From eq^n (1) and (2),

$$a = 1, \quad b = -1, \quad c = 1$$

So, $p(x) = 1x^2 + (-1)x + 1$

$= \boxed{x^2 - x + 1}$ Ans

Hence, quadratic polynomial is '$x^2 - x + 1$'.

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Solution of Que - 8

Given, A.P : -5, -1, 3, 7 ....

First term, $a = \boxed{-5}$ Ans

common difference, $d = a_2 - a_1 = -1-(-5)$

$= -1+5$

$= \boxed{4}$ Ans

Hence, required first term is '-5' and common difference is '4'.

Solution of Que - 9 (Or)

Two polygons of same no. of sides are similar if (i) their corresponding angles are equal and (ii) their corresponding sides are proportional.

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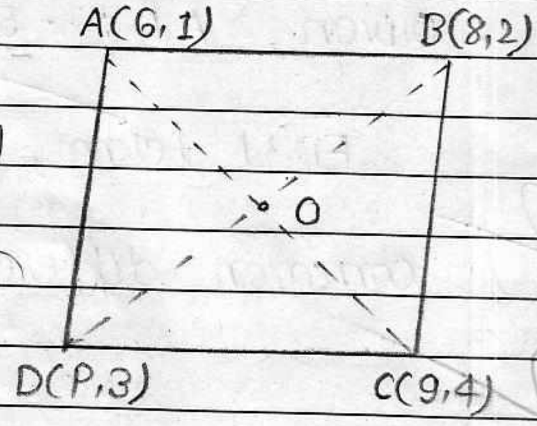
-:- Solution of Que - 10 (Or) -:-

Given :-



A(6,1), B(8,2), C(9,4) and D(P,3) are vertices of parallelogram. AC and BD are diagonals.

To Find :- value of p.

Solution :-

We know that diagonals of parallelogram bisect each other.

so,

AO = CO and BO = DO

i.e.,

coordinate of mid point of AC = coordinate of mid point of BD

by mid point formula,

$$\Rightarrow \left(\frac{6+9}{2}, \frac{1+4}{2}\right) = \left(\frac{8+P}{2}, \frac{2+3}{2}\right)$$

$$\Rightarrow \left(\frac{15}{2}, \frac{5}{2}\right) = \left(\frac{8+P}{2}, \frac{5}{2}\right)$$

on comparing,

$$\frac{15}{\cancel{2}} = \frac{8+P}{\cancel{2}}$$

$\Rightarrow 15 = 8+P \Rightarrow P = 15-8$

$\Rightarrow \boxed{P = 7}$ Ans

Hence, required value of p is '7'.

Solution of Que - 11

Given: A(5,2) B(4,7) and C(7,-4) are coordinates of $\triangle ABC$.

here,

$x_1 = 5$, $y_1 = 2$

$x_2 = 4$, $y_2 = 7$

$x_3 = 7$, $y_3 = -4$

To Find: $ar(\triangle ABC)$

Solution:

$$ar(\triangle ABC) = \frac{1}{2}\left[x_1(y_2-y_3) + x_2(y_3-y_1) + x_3(y_1-y_2)\right]$$

$$= \frac{1}{2}\left[5(7-(-4)) + 4(-4-2) + 7(2-7)\right]$$

$$= \frac{1}{2}\left[5(7+4) + 4(-6) + 7(-5)\right]$$

$$= \frac{1}{2}\left[5(11) + (-24) + (-35)\right]$$

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$= \frac{1}{2} [55 - 2, \; 5]$

$= \frac{1}{2} [55 - 59]$

$= \frac{1}{2} \times (-4) = -2$

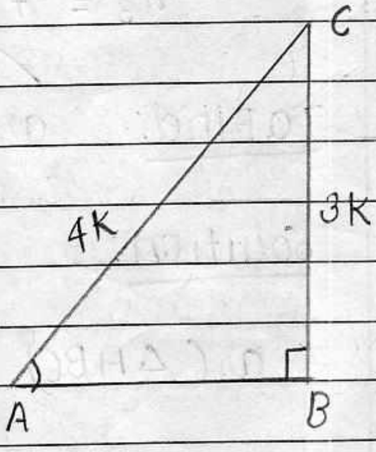
∵ Area is a measure which can't be negative. So, we need numeric value.

So, Area of $\Delta ABC = \boxed{2 \text{ sq. units}}$ Ans

Hence, required area is '2 sq. units'.

Solution of Que - 12

Let us consider ΔABC is right triangle, $\angle B = 90°$



Now,

$\sin A = \frac{3}{4}$

$\Rightarrow \frac{\text{Side opp. to } \angle A}{\text{Hypotenus}} = \frac{3}{4}$

$\Rightarrow \frac{BC}{AC} = \frac{3}{4}$

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So, if $BC = 3k$ then, $AC = 4K$

by pythagoras theorem,

$$AC^2 = AB^2 + BC^2$$
$$\Rightarrow (4K)^2 = AB^2 + (3K)^2$$
$$\Rightarrow 16K^2 = AB^2 + 9K^2$$
$$\Rightarrow 16K^2 - 9K^2 = AB^2$$
$$\Rightarrow AB = \sqrt{7K^2} = K\sqrt{7}$$

So, $\cos A = \dfrac{\text{Side adj. to } \angle A}{\text{Hypotenus}}$

$$= \frac{AB}{AC}$$
$$= \frac{\cancel{K}\sqrt{7}}{4\cancel{K}}$$
$$= \boxed{\frac{\sqrt{7}}{4}}$$ Ans

and

$\tan A = \dfrac{\text{Side opp. to } \angle A}{\text{Side adj. to } \angle A}$

$$= \frac{BC}{AB}$$
$$= \frac{3\cancel{K}}{\cancel{K}\sqrt{7}}$$
$$= \boxed{\frac{3}{\sqrt{7}}}$$ Ans

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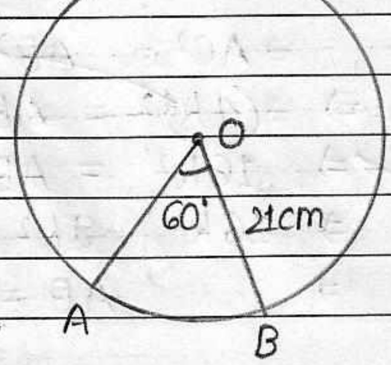
Solution of Que - 13 (Or) :-

Given:

An arc AB of a circle substend an Angle 60° at the center.



Now,

radius of circle $(r) = 21 cm$

angle of sector $(\theta) = 60°$

so,

$$\text{length of arc} = 2\pi r \cdot \frac{\theta}{360}$$

$$= \frac{2 \times 22}{\cancel{7}} \times \cancel{21}^{3} \times \frac{\cancel{60}}{\cancel{360}_{\cancel{6}\,2}}$$

$$= \frac{44}{2}$$

$$= \boxed{22 \text{ cm}} \text{ Ans}$$

Hence, length of arc is "22 cm".

-:- Solution of Que-14 -:-

Impossible event: The probability of that ~~an~~ event that can't be happen or impossible to occur is 0 and such an event is called Impossible event.

-:- Solution of Que-15 (or) -:-

Given: $P(E) = 0.06$

To Find: P not E i.e., $P(\bar{E})$

Solution:

As, we know that

$$P(E) + P(\bar{E}) = 1$$

$$\Rightarrow 0.06 + P(\bar{E}) = 1$$

$$\Rightarrow P(\bar{E}) = 1 - 0.06$$

$$\Rightarrow \boxed{P(\bar{E}) = 0.94} \quad \text{Ans}$$

Hence, required probability is '0.94'.

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Solution of 16

Given, quadratic eq^n:

$$2x^2 + x - 6 = 0$$

by factorisation method,

$$2x^2 + 4x - 3x - 6 = 0$$

$$\Rightarrow 2x(x+2) - 3(x+2) = 0$$

$$\Rightarrow (2x-3)(x+2) = 0$$

so,

$$2x - 3 = 0 \quad \text{or} \quad x + 2 = 0$$

$$\Rightarrow 2x = 3 \qquad \boxed{x = -2} \text{ Ans}$$

$$\Rightarrow \boxed{x = \frac{3}{2}} \text{ Ans}$$

Hence, required roots are '$\frac{3}{2}$' and '-2'.

Solution of Que -17

Given AP : 3, 8, 13, 18 ---------.

first term, $a = 3$

common difference, $d = 8 - 3 = 5$

Let 78 be n^{th} term of an A.P.

i.e., $a_n = 78$

$$\Rightarrow a + (n-1)d = 78 \qquad [\because a_n = a + (n-1)d]$$

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$\Rightarrow 3+(n-1)5 = 78$

$\Rightarrow (n-1)5 = 78-3$

$\Rightarrow (n-1)5 = 75$

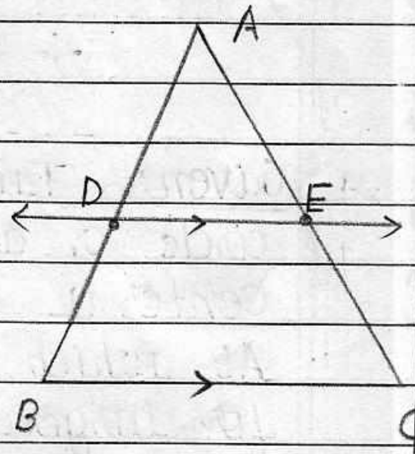
$\Rightarrow (n-1) = \frac{75}{5}$

$\Rightarrow n = 1+15$

$\Rightarrow \boxed{n=16}$ Ans

Hence, 78 is 16th term of A.P.

Solution of Que- 18



Given: A ΔABC where a line intersect AB at D and AC at E, such that $DE \parallel BC$.

To prove: $\frac{AD}{AB} = \frac{AE}{AC}$

Proof: In ΔABC,

$\because DE \parallel BC$

$\therefore$ by Basic proportionality theorem

$$\frac{AD}{DB} = \frac{AE}{EC}$$

$\Rightarrow \frac{DB}{AD}+1 = \frac{EC}{AE}+1$ [on taking reciprocal and adding 1 both side]

$$\Rightarrow \frac{DB+AD}{AD} = \frac{EC+AE}{AE}$$

$$\Rightarrow \frac{AB}{AD} = \frac{AC}{AE} \quad \left[\because \begin{array}{l} DB+AD = AB \\ EC+AE = AC \end{array}\right]$$

Again taking reciprocal both sides,

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

Hence, proved.

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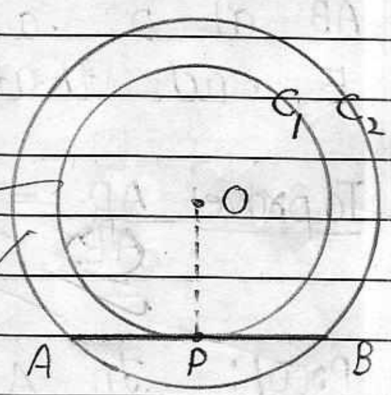
-|- Solution of Que-19 -|-

<u>Given</u>: Two concentric circle C_1 and C_2 with center O. and AB which is chord for larger circle C_2 & is a tangant for inner circle C_1 at point P.



<u>To prove</u>: $AP = BP$

<u>Cons</u>: Join OP.

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proof: For smaller circle C_1.

OP is radius and AB is tangant with point of contact P.

so,

$OP \perp AB$ [∵ Tangant is $\perp$ to ~~radius~~ through the paint of contact]

Now,

For larger circle C_2

AB is a chord and $OP \perp AB$ [Proved above]

So,

$\boxed{AP = BP}$ [∵ Perpendicular drawn from center bisect the chord]

thus, In two concentric circles, the chord of larger circle, which touches smaller, is bisected at point of contact.

Hence, proved.

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Solution of Que. 20 (Or)

Given,

$$x + y = 5 \quad \text{———} (1)$$

$$\text{and } 2x - 3y = 4 \quad \text{———} (2)$$

From eq^n (1),

$$x + y = 5$$

$$\Rightarrow x = 5 - y \quad \text{———} (3)$$

on substituting value of x in eq^n (2), we get

$$2(5-y) - 3y = 4$$

$$\Rightarrow 10 - 2y - 3y = 4$$

$$\Rightarrow -5y = 4 - 10$$

$$\Rightarrow -5y = -6$$

$$\Rightarrow y = \frac{-6}{-5} = \boxed{\frac{6}{5}} \quad \underline{\text{Ans}}$$

put $y = \frac{6}{5}$ in (3),

$$\Rightarrow x = 5 - \frac{6}{5} = \frac{25-6}{5}$$

$$\Rightarrow \boxed{x = \frac{19}{5}} \quad \underline{\text{Ans}}$$

Hence, required value of '$x = \frac{19}{5}$' and '$y = \frac{6}{5}$'.

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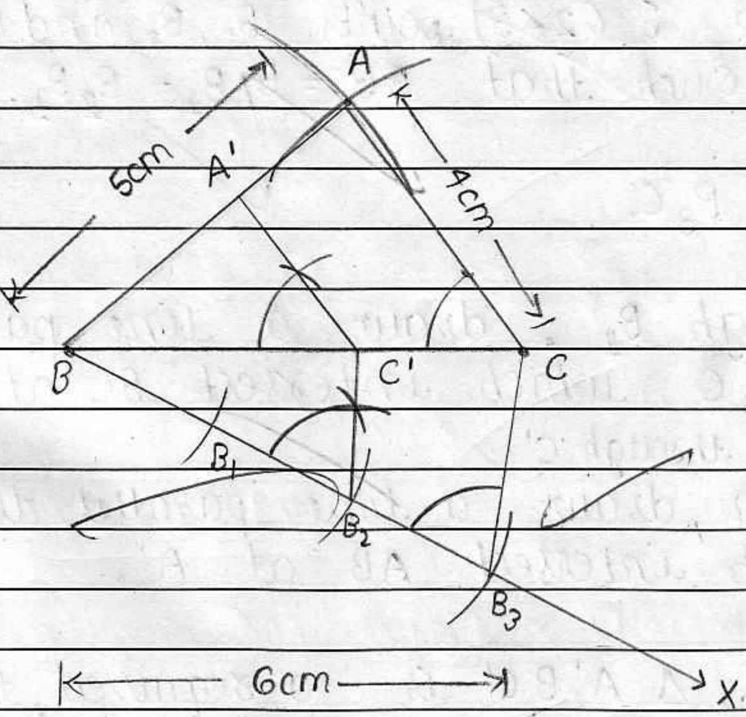
Solution of Que - 21



Steps of construction:

1) First we draw a line segment BC=6cm

2) With B as center draw an arc of radius 5 cm

3) With C as center draw an arc of radius 4cm which intersect previous arc at point A.

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4) Join AB and AC. So, ABC is a Δ.

5) Draw a ray BX making an acute angle with BC.

6) mark 3 $(2<3)$ points B_1, B_2 and B_3 on BX Such that $BB_1 = B_1B_2 = B_2B_3$.

7) Join B_3C.

8) Through B_2, draw a line parallel to B_3C which intersect BC at C'.

9) Again through C' draw a line parallel to AC which intersect AB at A'.

Thus $\Delta A'BC'$ is a required triangle.

Justification:

In $\Delta A'BC'$ and ΔABC

$\angle B = \angle B$ [common]

$\angle BA'C' = \angle BAC$ [corresponding angles as $A'C' \parallel AC$]

$\therefore \Delta A'BC' \sim \Delta ABC$ [AA similarity]

So, $\frac{A'B}{AB} = \frac{BC'}{BC} = \frac{A'C'}{AC}$ [Sides are proportional of similar Δ] ——(1)

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Now, In $\Delta BC'B_2$ and ΔBCB_3

$\angle B = \angle B$ [common]

and $\angle BC'B_2 = \angle BCB_3$ [corresponding angles as $B_2C' \parallel B_3C$]

$\therefore \Delta BC'B_2 \sim \Delta BCB_3$ [AA similarity]

So, $\dfrac{BC'}{BC} = \dfrac{BB_2}{BB_3}$ [$\because$ corresponding sides are proportional of similar Δ]

But, $\dfrac{BB_2}{BB_3} = \dfrac{2}{3}$ [by cons.]

$\Rightarrow \dfrac{BC'}{BC} = \dfrac{2}{3}$ —— ②

From eq^n ① and ②,

$$\frac{A'B}{AB} = \frac{BC'}{BC} = \frac{A'C'}{AC} = \frac{2}{3}$$

$A'B = \dfrac{2}{3}AB$, $BC' = \dfrac{2}{3}BC$

and $\cancel{BC' = \dfrac{2}{3}B}$ $A'C' = \dfrac{2}{3}AC$

Hence, Justified.

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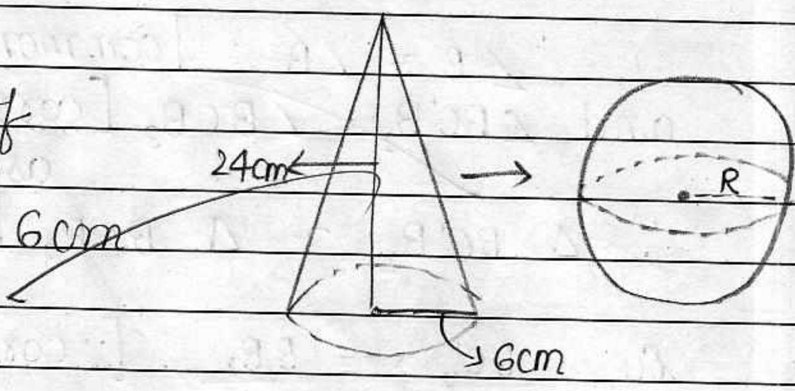
-: Solution of Que - 22 (or) -:

Given,

radius of base of cone $(r) = 6cm$



and

height of cone $(h) = 24cm$

So, volume of cone $= \frac{1}{3}\pi r^2 h$

$= \left(\frac{1}{3} \times \pi \times 6 \times 6 \times 24\right) cm^3$

∵ A child reshapes it in form of sphere.

Let 'R' be the radius of resulting sphere.

So,

Volume of sphere $= \frac{4}{3}\pi R^3 \ cm^3$

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According to question:

Volume of cone = volume of sphere

$\Rightarrow \frac{1}{3} \times \cancel{\pi} \times 6 \times 6 \times 24 = \frac{4}{3} \cancel{\pi} R^3$

$\Rightarrow \frac{6 \times 6 \times 24}{\cancel{3}} = \frac{4}{\cancel{3}} R^3$

$\Rightarrow R^3 = \frac{6 \times 6 \times \cancel{24}\,6}{\cancel{4}}$

$\Rightarrow R = \sqrt{6 \times 6 \times 6}$

$\Rightarrow \boxed{R = 6\,cm}$ Ans

Hence, required radius of sphere is '6cm'.

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माध्यमिक शिक्षा मण्डल, मध्यप्रदेश, भोपाल

4 पृष्ठीय

परीक्षार्थी द्वारा भरा जायें ↓

परीक्षा का विषय	विषय कोड			परीक्षा का माध्यम
MATHEMATICS	1	0	0	ENGLISH

परीक्षा का दिनांक 22 02 22

स्टीकर तीर के निशान ↓ से मिलाकर लगायें

परीक्षा का नाम एवं परीक्षा केन्द्र क्रमांक की मुद्रा

केन्द्र क्रमांक-321040
हाई स्कूल परीक्षा

पर्यवेक्षक का नाम एवं हस्ताक्षर

केन्द्राध्यक्ष/सहायक केन्द्राध्यक्ष के हस्ताक्षर

परीक्षार्थी द्वारा भरा जायें →

मुख्य उत्त

प्रश्न क्र.

Solution of Que - 23 (Or)

class interval	frequency f_i	class mark x_i	$f_i x_i$
20-60	7	40	280
60-100	5	80	400
100-150	16	125	2000
150-250	12	200	2400
250-350	2	300	600
350-450	3	4800	1200
Total	$\Sigma f_i = 45$		$\Sigma f_i x_i = 6880$

M
P
B
S
E

पृष्ठ के अंकों का योग

योग पर्व पृष्ठ + पृष्ठ अंक = कुल अंक

प्रश्न क्र.

$\therefore$ by direct mean method,

$$mean = \bar{x} = \frac{\sum f_i x_i}{\sum f_i}$$

$$= \frac{\cancel{6880}\ 1376}{\cancel{45}\ 9}$$

$$= \frac{1376}{9}$$

$$= \boxed{152.88}$$ Ans

M P B S E

Hence, required mean no. of wickets is ~~153~~ '152.88'.