CENTRAL BOARD OF SECONDARY EDUCATION, DELHI

Secondary School Examination (Class X)

क्रम संख्या Serial No.:

CN-D 0218799

To be filled in by the candidate as per Admit Card

लिखें तथा संगत गोले को पूरे गहरे निशान से भरें ।
Write and darken the appropriate circle as applicable.

*परीक्षार्थी का नाम बड़े अक्षरों में **Candidate's Name in CAPITAL letters**

GODADI MOHAMMED DANIYA

अनुक्रमांक **Roll No.**

20153397

As per Admit Card

विषय कोड
Subject Code

041

केन्द्र संख्या
Centre No.

837227

MATHEMATICS STANDARD

55667

Roll No. (in words): TWO ONE FIFTY THREE

THREE HUNDRED NINETY SEVEN ONLY

Father's/Guardian's Name: GODADI RIZWAN AHMED

Signature of Candidate: G. Daniyal Bu

PG : 06408

041/00647/57128799/8

Please read "Instructions to Candidates" on back side

WITH GRAPH PAPER

केन्द्रीय माध्यमिक शिक्षा बोर्ड, दिल्ली
सैकण्डरी स्कूल परीक्षा (कक्षा दसवीं)
परीक्षार्थी प्रवेश–पत्र के अनुसार भरें

94674

विषय Subject : MATHEMATICS STANDARD

विषय कोड Subject Code : 041

परीक्षा का दिन एवं तिथि
Day & Date of the Examination : Monday & 11:03:2024

उत्तर देने का माध्यम
Medium of answering the paper : ENGLISH

प्रश्न पत्र के ऊपर लिखे कोड को दर्शाऐं : Write code No. as written on the top of the question paper :	Code Number	Set Number
	30/4/2	① ● ③ ④

अतिरिक्त उत्तर–पुस्तिका (ओं) की संख्या No . of supplementary answer -book(s) used	NIL
बेंचमार्क विकलांग व्यक्ति : हाँ / नहीं Person with Benchmark Disabilities : Yes / No	No
विकलांगता का कोड (प्रवेश पत्र के अनुसार) Code of Disability (As per the admit card)	No
क्या लेखन – लिपिक उपलब्ध करवाया गया : हाँ / नहीं Whether writer provided : Yes / No	No
यदि दृष्टिहीन हैं तो उपयोग में लाए गये सोफ्टवेयर का नाम : If Visually challenged, name of software used :	No

*एक खाने में एक अक्षर लिखें। नाम के प्रत्येक भाग के बीच एक खाना रिक्त छोड़ दें। यदि परीक्षार्थी का नाम 22 अक्षरों से अधिक है, तो केवल नाम के प्रथम 22 अक्षर ही लिखें।

Each letter be written in one box and one box be left blank between each part of the name. In case Candidate's Name exceeds 22 letters, write first 22 letters.

कार्यालय उपयोग के लिए
Space for office use

57128799
041 / 00647

Instructions to Candidates

1. On receiving the answerbook
   (I) ensure that answer book contains 48 pages.
   (II) check that all pages are serially numbered (including title page).
   (III) fill in and blacken all the required details/fields correctly.
   (Iv) use only blue-black or royal blue ink/gel/ballpoint pen.
2. Write on each ruled line on both sides of the answer book.
3. Number your answers according to their numbers in the question paper.
4. Draw a line when a question (or a part thereof) is finished.
5. Draw appropriate margin on the right side of the page for rough work which should be crossed out afterwards.
6. Securely tag your answer book with supplementary answer book(s), graphs, maps etc.
7. DO NOT
   (i) waste pages by leaving wide margin.
   (ii) make any special sign or mark in or outside the answer book, supplementary answer book, graph, map etc.
   (iii) write your roll number, name of your school or place of examination in any of your answers.
   (iv) fold the pages of the answer book.
   (v) ask for supplementary answer book unless this answer book/previous supplementary answer book is finished.
   (vi) leave the examination hall without handing over the answer book to the Assistant Supenntendent.
8. Indulging in any of the following activities shall be deemed as use of unfair means practice, result shall not be declared but marked as UNFAIR MEANS (UFM):
   (a) Having in possession any item or article which has been prohibited in examination centre or may be used for unfair practices including any stationery item, communication device, accessories, eatable items, ornaments or any other material or information relevant or not relevant to the examination in the paper concerned;
   (b) Paying /Placing someone else to write examination (impersonatlon) on candidate's behalf or preparing material for copying;
   (c) Breaching examination rules or any direction issued by CBSE from time to time, in connection with the conduct of EXAMINATIONS;
   (d) Assisting other candidate to engage in malpractice, giving or receiving assistance directly or indirectly of any kind or attempting to do so;
   (e) Writing questions or answers on any material other than the answer book given by the Centre Superintendent for writing answers;
   (f) Tearing of any page of the answer book or supplementary answer book etc.;
   (g) Contacting or communicating or trying to do so with any person, other than the Examination Staff, during the examination time in the examination Centre;
   (h) Communicating with another candidate or the Assistant Superintendent directly or indirectly;
   (i) Taking away the answer book out of the examination hall/room/centre;
   (j) Smuggling out Question Paper or its part or smuggling out answer books/ supplementary answer sheet or part thereof;
   (k) Threatening any of the officials connected with the conduct of the examinations of threatening any of the candidates;
   (l) Using or attempting to use any other undesirable method or means in connection with the examination;
   (m) Forceful entry/exit in room/ Examination Centre/Hall;
   (n) Use or attempted use of any electronic device after entering the examination centre;
   (o) Uploading/sharing any examination related material, correct or wrong, on social media;
   (p) Affixing/uploading of fabricated photograph on the admit card;
   (q) Erasing or obliterating any information printed on the ANSWER BOOK(S);
   (r) Providing wrong information on the answer sheets;
   (s) Having in possession question papers of previous years;
   (t) If a candidate approaches any Authority(ies)/person(s) related to the conduct of exams soliciting unauthorized privilege(s) in these examinations;
   (u) Taking legal course or any other to influence CBSE for gaining advantage in their favour, by providing false information.

केन्द्रीय माध्यमिक शिक्षा बोर्ड, दिल्ली 946674 WITH GRAPH PAPER

CENTRAL BOARD OF SECONDARY EDUCATION, DELHI

SECONDARY SCHOOL EXAMINATION (CLASS X)

सैकण्डरी स्कूल परीक्षा (कक्षा दसवीं)

Q.No.	01	02	03	04	05	06	07	08	09	10	TOTAL
Marks	1	1	1	1	1	1	1	1	1	1	10

Q.No.	11	12	13	14	15	16	17	18	19	20	TOTAL
Marks	1	1	1	1	1	1	1	1	1	1	10

Q.No.	21	22	23	24	25	26	27	28	29	30	TOTAL
Marks	2	2	2	2	zero	3	3	3	3	2½	22½

Q.No.	31	32	33	34	35	36	37	38	39	40	TOTAL
Marks	3	4	5	zero	4½	3½	4	3½	—	—	27½

TOTAL MARKS IN WORDS	Seventy only	GRAND TOTAL	66½ (70)

CBSE

मैं प्रमाणित करता/करती हूँ कि मैने इस उत्तर पुस्तिका का मूल्यांकन प्रश्न पत्र के सही सेट एवं अंक योजना के निर्देशों के अनुसार किया है और उत्तर पुस्तिका के अंदर कोई भी प्रश्न बिना मूल्यांकन के नहीं छोड़ा गया है। इसके अलावा, अंक सही ढ़ंग से पोस्ट किए गए हैं। मैंने अनुदेशों के अनुसार कार्य पूरा किया है।

I certify that I have evaluated this answer book according to the correct set of question paper, and as per instructions given in marking scheme and no question has been left un-assessed inside the answer book.

मैं प्रमाणित करता/करती हूँ कि मैने इस उत्तर पुस्तिका की जांच, मूल्यांकन की गुणवत्ता का पता लगाने के लिए की है। मूल्यांकन अनियमित नहीं है, इस उत्तर पुस्तिका का कोई भी भाग बिना मूल्यांकन के नहीं है, इसकी जांच प्रश्न पत्र के सही सेट के साथ एवं पूरी तरह से अंक योजना के अनुसार की है।

☐ अधिकतम थ्योरी अंकों का 96% से 100% अंक प्राप्त उत्तर पुस्तिकाओं की जांच की और सही पाया।

Mathematics - Standard

SECTION - E

Case Study - 1

36. (i) Volume of cuboid = $l \times b \times h$ = 30 cm × 32 cm × 15 cm

Volume of carton = 9600 cm^3 ½ (1½)

(3½)

(ii) (a) Given, l = 15 cm, b = 8 cm, h = 5 cm

T.S.A of cuboid = $2(lb + bh + hl)$

$= 2(15 \times 8 + 8 \times 5 + 5 \times 15) = 2(120 + 40 + 75)$

T.S.A of 1 milk packet = $2(235)$ = **470 cm^2** (2)

(iii) Volume of cylinder = $\pi r^2 h$

$= \frac{22}{7} \times (5)^2 \times 7 = 22 \times 25 =$ **550 cm^3** (1)

∴ The cup can hold **550 cm^3** of milk.

640×15

3200
640
9600

15×8

120

15×5

75
160
75
235 × 2
470

25×22

50
50
550

Case Study - 2

37. (i) mid-point $= \left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$ — (1)

F(-3, 0) Gr(1, 4)

(4) $(x, y) = \left(\frac{-3+1}{2}, \frac{0+4}{2}\right) = \left(\frac{-2}{2}, \frac{4}{2}\right) = \boxed{(-1, 2)}$

∴ Midpoint of the segment joining F and Gr is (-1, 2) //

(ii) distance $= \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$ — (2)

A(3, 4) C(-1, -2)

$AC = \sqrt{(-1-3)^2 + (-2-4)^2} = \sqrt{(-4)^2 + (-6)^2} = \sqrt{16+36} = \sqrt{52}$ units

$\boxed{AC = 2\sqrt{13} \text{ units}}$

2|52
2|26
13

(iii) $\boxed{D(-2, -5)}$ — (1)

~~D(x, y)~~

Case Study -3

38) (i) Given, $a_n = 20 + 4n$

$n = 1$, $a_1 = 20 + 4(1) = 20 + 4 = \boxed{24 = a}$ (1)

$\therefore$ First spot is 24 //

(ii) $a_n = 20 + 4n$

$112 = 20 + 4n$

$112 - 20 = 4n$

$\frac{92}{4} = n$

$\boxed{n = 23}$ (2)

$\therefore$ 23rd spot is numbered as 112 //

(iii) $a_{n-2} = 20 + 4(n-2)$ $\{n = 1\}$

$a_{1-2} = 20 + 4(1-2)$

$a_{-1} = 20 + 4(-1)$

$a_{-1} = 20 - 4 = \boxed{16}$ (1/2)

$\therefore$ The number 16 is on the $(n-2)^{th}$ spot //

SECTION-D

32. (a) $(K+1)x^2 - 2(3K+1)x + (8K+1) = 0$

$a = K+1$, $b = -2(3K+1)$, $c = 8K+1$

(A)

$D = 0$

$b^2 - 4ac = 0$

$[-2(3K+1)]^2 - 4(K+1)(8K+1) = 0$

$4(3K+1)^2 - 4(8K^2+K+8K+1) = 0$

$4(9K^2+1^2+2(3K)(1)) - 4(8K^2+9K+1) = 0$

$4(9K^2+1+6K) - 32K^2 - 36K - 4 = 0$

~~$36K^2 + 4 + 24K - 32K^2 - 36K - 4 = 0$~~

$36K^2 + 4 + 24K - 32K^2 - 36K - 4 = 0$

$4K^2 - 12K = 0$

$4K^2 = 12K$

$\frac{4K^2}{K} = 12$

$K = 12/4$

$\boxed{K = 3}$

The value of K is 3 //

33.

(8)

C.I	fi	xi	fixi
5-15	6	10	60
15-25	11	20	220
25-35	21	30	630
35-45	23	40	920
45-55	14	50	700
55-65	5	60	300

$\Sigma fi = 80$ $\quad \Sigma fixi = 2830$

Modal class = 35-45

$l = 35$

$h = 10$

$f_0 = 21$

$f_1 = 23$

$f_2 = 14$

* Mean $= \frac{\Sigma fixi}{\Sigma fi} = \frac{2830}{80} = 35.375$

* Mode $= l + \left(\frac{f_1 - f_0}{2f_1 - f_0 - f_2}\right) \times h$

$= 35 + \left(\frac{23-21}{46-21-14}\right) \times 10 = 35 + \left(\frac{2}{16\ 8_4}\right) \times 10^5$

$= 35 + 5/4 = 35 + 1.25 = 36.25$

∴ Mean is 35.375 and mode is 36.25 //

$\frac{23 \times 4}{92}$

$\frac{14 \times 5}{70}$

$8\overline{)283}$ (35.375)

24

43

40

30

24

60

56

40

$4\overline{)5}$ (1.25)

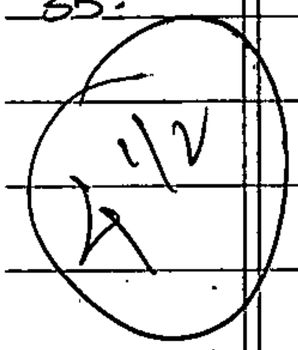
4

10

8

20

35.



In $\triangle ABE$,

$\tan 45^\circ = h/x$

$1 = h/x$

$\boxed{x = h}$ m $\longrightarrow$ ①

In $\triangle ACD$,

$\tan 60^\circ = \frac{h+50}{x}$

$\sqrt{3} = \frac{h+50}{x}$

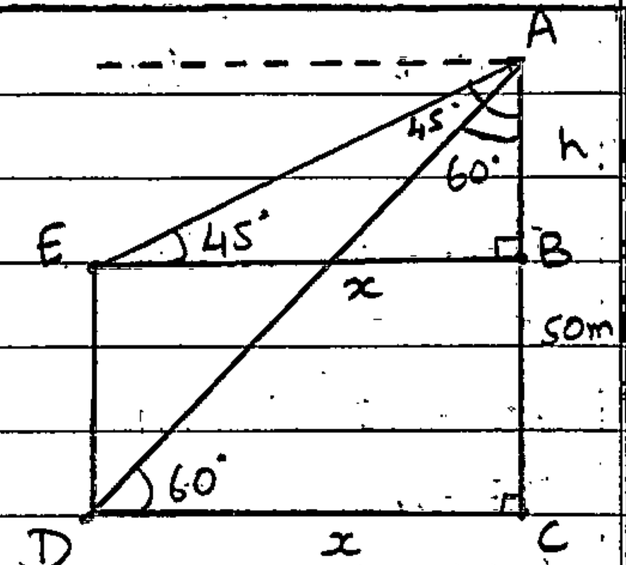
$\sqrt{3}x = h + 50$

$\sqrt{3}h = h + 50$ (by ①)

$\sqrt{3}h - h = 50$

$h(\sqrt{3}-1) = 50$

$h = \frac{50}{\sqrt{3}-1} = \frac{50}{1.73-1} = \frac{50}{0.73} = \underline{\underline{67.48\ m}}$



Height of the tower = $h + 50\ m = 67.48 + 50\ m$

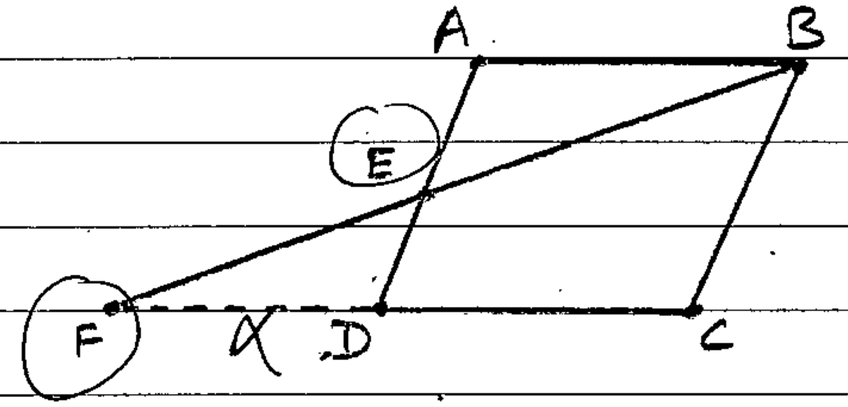
$= \underline{\underline{117.48\ m}}$

∴ The height of the tower is $\underline{\underline{117.48\ m}}$ //

67.48
73 | 5000
438
620
584
360
292
680
657
657
2
73×8
584
1 73
73×4
292
1
73×5
365
73
436
146
584

34. (a) To prove: $\triangle ABE \sim \triangle CFB$

Zero



In $\triangle FBC$, by BPT,

$$\frac{FE}{EB} = \frac{FD}{DC} \longrightarrow (1)$$

In $\triangle FED$ & $\triangle BEA$,

$\angle E = \angle E$ (vertically opposite angles)

$\angle F = \angle B$ (Alternate angles)

$\triangle ABE \sim \triangle DFE$ (by AA Similarity) $\longrightarrow$ (2)

In $\triangle FED$ & $\triangle FBC$,

$\angle E = \angle B$ (corresponding angles)

$\angle F = \angle F$ (common)

$\triangle DFE \sim \triangle CFB$ (by AA Similarity) $\longrightarrow$ (3)

By eqn. (2) & (3)

$\triangle ABE \sim \triangle CFB$ //

hence proved //

SECTION - C

26. (a) (i) P(atleast one head) = $\frac{\text{No of favorable outcomes}}{\text{Total no. of outcomes}}$

{HHH, HHT, HTH, THH, ~~TTT~~, TTH, THT, HTT}

(3) = $\frac{7}{8}$

(ii) P(exactly two tails) = $\frac{3}{8}$

{TTH, THT, HTT}

(iii) P(atmost one tail) = $\frac{4}{8} = \frac{1}{2}$

{HHH, HHT, HTH, THH}

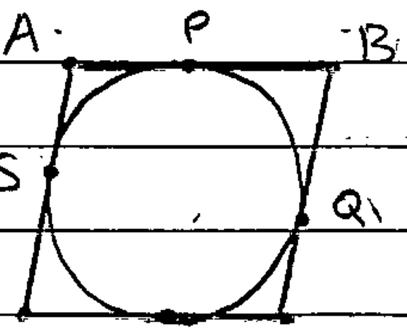
27. (a)

AP = AS ⟶ (1) (tangents)

BP = BQ ⟶ (2) (tangents)

CR = CQ ⟶ (3) (tangents)

DR = DS ⟶ (4) (tangents)



(1) + (2) + (3) + (4)

(AP + BP) + (CR + DR) = (AS + DS) + (BQ + CQ)

AB + CD = AD + BC

Given, parallelogram has equal opposite sides //

$AB \parallel CD$, $BC \parallel AD$

$AB + AB = BC + BC$ { $AB = CD$ & $AD = BC$ }

$2AB = 2BC$

$\boxed{AB = BC}$

$\therefore$ Adjacent sides are equal in the parallelogram

$\therefore$ It is Rhombus //

28. Let's assume that $\sqrt{3}$ is a rational number.

(B)

$$\frac{a}{b} = \frac{2-\sqrt{3}}{5} \quad (a \text{ \& } b \text{ are co-primes})$$

$$\frac{5a}{b} = 2-\sqrt{3}$$

$$\frac{5a}{b} - 2 = -\sqrt{3}$$

$$\frac{5a-2b}{b} = -\sqrt{3}$$

$$-\left(\frac{5a-2b}{b}\right) = \sqrt{3}$$

Given that $\sqrt{3}$ is irrational & contradiction occurs.
Our assumption was wrong.
$\therefore \sqrt{3}$ is an irrational number & $\frac{2-\sqrt{3}}{5}$ is also an irrational number.

30. (OR)

(b) $x^2 + x - 2 = 0$, α & β are zeroes.

2 1/2

Sum $= \alpha+\beta = \frac{-b}{a} = \frac{-1}{1} = \boxed{-1}$

Product $= \alpha\beta = \frac{c}{a} = \frac{-2}{1} = \boxed{-2}$

$\Rightarrow \frac{\alpha}{\beta} + \frac{\beta}{\alpha} \Rightarrow \frac{\alpha^2+\beta^2}{\alpha\beta}$

$\Rightarrow \frac{(\alpha+\beta)^2 - 2\alpha\beta}{\alpha\beta}$ $\{ a^2+b^2 = (a+b)^2 - 2ab \}$

$\Rightarrow \frac{(-1)^2 - 2(-2)}{-2} = \frac{1+2}{-2} = \frac{3}{-2} = \frac{-3}{2}$

$\therefore \boxed{\frac{\alpha}{\beta} + \frac{\beta}{\alpha} = \frac{-3}{2}}$ //

31) Given, $a_{14} = ₹\ 15000$; $a_{10} = ₹\ 18000$

$a + 3d = 15000$; $a + 9d = 18000$

$\hookrightarrow$ (1) $\hookrightarrow$ (2)

(1) $\Rightarrow$ $a + 3d = 15000$

(2) $\Rightarrow$ $a + 9d = 18000$

(−) (−) (−)

$+6d = +3000$

$d = \frac{3000}{6}$

$\boxed{d = ₹500}$

$a + 3d = 15000$

$a + 3(500) = 15000$

$a + 1500 = 15000$

$a = 15000 - 1500$

$\boxed{a = ₹\ 13500}$

∴ The man started the job with ₹ 13500.
He got increment of ₹ 500 every ~~month~~ year //

~~31.~~ ~~Given,~~ SECTION - B

21. (OR)

(b)

(✓)

$\sin(A-B) = \frac{1}{2}$; $\cos(A+B) = \frac{1}{2}$

~~$\sin(A-B) = \sin 30°$~~ ; ~~$\cos(A+B) = \cos 60°$~~

$A-B = 30°$; $A+B = 60°$

$\longrightarrow$ (1) $\longrightarrow$ (2)

(1) $\Rightarrow$ $A-B = 30°$ | $A+B = 60°$

(2) $\Rightarrow$ $A+B = 60°$ | $45° + B = 60°$

$2A = 90°$ | $B = 60° - 45°$

$\boxed{A = 45°}$ | $\boxed{B = 15°}$

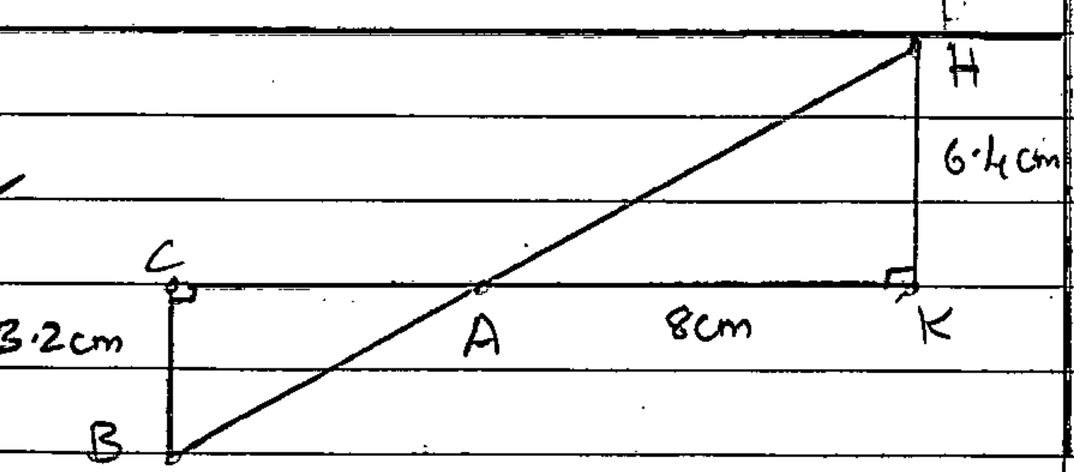
$\therefore$ A is 45° and B is 15° //

22. (✓)

Given, $\triangle AHK \sim \triangle ABC$

$\frac{HK}{BC} = \frac{AK}{AC}$

$\frac{6.4}{3.2} = \frac{8}{AC}$



$\boxed{AC = 4\text{ cm}}$

∴ The length of AC is 4cm //

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23. (2)

L·C·M (40, 48) = $2^3 \times 5 \times 6 = 240$

H·C·F (40, 48) = $2^3 = 8$

2	40, 48
2	20, 24
2	10, 12
5	5, 6
6	1, 6
	1, 1

There should be minimum of 240 books in the library //

~~⇒ 240 / 8~~

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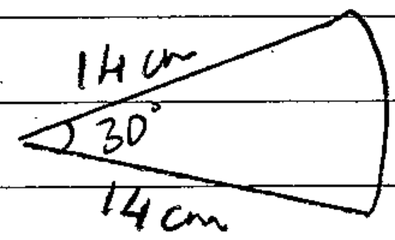
24. (a) (2)

The angle swept by the minute hand in 1 minute is 6°

$\boxed{1 \text{ minute} = 6^\circ}$

$\boxed{5 \text{ minute} = 5 \times 6^\circ = 30^\circ}$



Area of minor sector $= \frac{\theta}{360^\circ} \times \pi r^2$

$= \frac{30^\circ}{360^\circ} \times \frac{22}{7} \times 14 \times 14$

$= \frac{22 \times 7}{3} = \boxed{\frac{154}{3} \text{ cm}^2}$

$\frac{22 \times 7}{154}$

∴ The area on the face of the clock described by the minute hand in 5 minutes is $\frac{154}{3}$ cm² //

25.

$OA = OB$ (radii)

$PA = PB$ (tangent)

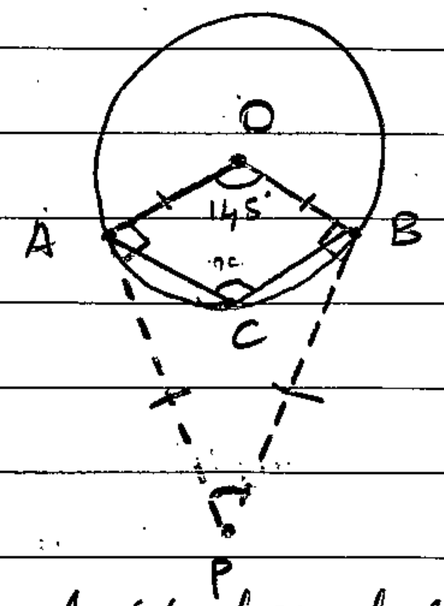
In PAOB, Angle Sum property,

$\angle P + \angle A + \angle B + \angle O = 360^\circ$

$\angle P + 90^\circ + 90^\circ + 145^\circ = 360^\circ$

$\boxed{\angle P = 360^\circ - 325 = 35^\circ}$

$\boxed{\angle C = 145^\circ}$



∴ opposite ~~sides~~ angles of a quadrilateral inside the circle is always equal

$\boxed{\angle AOB = \angle ACB = x = 145^\circ}$ //

SECTION-A

1) (A) $\frac{1}{2\sqrt{2}}$ ✓ (1)

2) (C) $3\pi : 1$ ✓ (1)

3) (C) 8.4 cm ✓ (1)

4) (A) 3π cm^2 ✓ (1)

5) (B) $P+q=19$ ✓ (1)

6) (B) $45°$ ✓ (1)

7) (B) 1:4 ✓ (1)

8) (C) $a-b$ ✓ (1)

9) (A) $96°$ ✓ (1)

10) (C) -1 ✓ (1)

11) (B) $(0,-1)$ ✓ (1)

12) (D) $9/36$ ✓ (1)

13) (D) $-15x + 9y = 5$ ✓ (1)

14) (B) 7.5 cm ✓ (1)

15) (C) $1/2$ ✓ (1)

16) (C) 2 ✓ (1)

17) (B) $x^2 - 4x - 1$ ✓

18) (D) 5 ✓

19) (A) Both Assertion (A) and reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

20) (C) Assertion (A) is true, but Reason (R) is false.

Rough - work

$(a+b)x + (a+b)y = a^2 - b^2$

$x + y = a - b$

$\alpha = 2+\sqrt{5}$

$\alpha + \beta = 4$

$\beta = 4 - 2 + \sqrt{5}$

$\alpha\beta = (4 - 2 + \sqrt{5})(2+\sqrt{5}) = 8 + 4\sqrt{5} - 4 - 2\sqrt{5} + 5 = 9$

$4 + 5 + 4\sqrt{5}$

$\frac{9}{5} = \frac{13.5}{x}$

$9x =$

$-\frac{2+8}{2}, \frac{3+3}{2} = \frac{x+6}{2}, \frac{y+7}{2}$

$3, 3 =$

$\therefore x = 0 \quad y = -1$

$\frac{4 \pm 2\sqrt{5}}{2}$. $2+\sqrt{5}$

$35 + p + q = 54$

$p + q =$

$2\pi r = 176$

$r = \frac{176 \times 7}{88}$

$\frac{\sin 45^\circ}{2} \quad \frac{1/\sqrt{2}}{2} \quad \frac{1}{2\sqrt{2}}$

$6p + 10 = 3p - x + 5p + x$

$10 = 2p$

$\frac{-1}{3} \quad \frac{-1}{3} \quad x = 2 \quad y = 2$

(1,3) (3,1) (1,5)
(3,3) (1,1) (1,
(5,2) (5,1)

$\frac{3\pi(4)}{3\pi(4)^2}$

$\frac{3\pi r^2}{3\pi(r^2)^2}$

$\frac{4}{88}$ $\frac{35}{19}$ $\frac{22}{7}$ $\frac{84}{96}$ $\frac{1120}{366} \times \frac{22}{7} r^3$

$\frac{4+6}{3} = \frac{10}{3} = K$

$\frac{-2 + -10}{3} = \frac{-12}{3}$

5 | 8825
5 | 765
3 | 153
3 | 51
17 | 17

(1,1) (1,3) (1,5)
(3,1) (3,3) (3,5)
(5,1) (5,3) (5,5)

$1 : r^2$

$\frac{3\pi(4)}{8r}$

$\frac{1}{4} \times \frac{22}{7} \pi r$ $\frac{\pi r}{2}$ $\frac{\pi r^2}{4\pi r}$

$\frac{\pi r}{2\pi r}$

$\frac{7.5}{9} \overline{)67.5}$ $\frac{63}{45}$

$\frac{13.5 \times 5}{67.5}$ $2\overline{)20}\ 5$

$4 - 12c = 16$

$-12c = 12$

$\frac{1}{3}$

SECTION - C

29. (3)

$\boxed{\sin\theta + \cos\theta = p}$ ⟶ ①

Square on both sides

$(\sin\theta + \cos\theta)^2 = p^2$

$(\sin^2\theta + \cos^2\theta + 2\sin\theta\cos\theta) = p^2$

$1 + 2\sin\theta\cos\theta = p^2$

$\boxed{\sin\theta\cos\theta = \frac{p^2-1}{2}}$ ⟶ ②

$\sec\theta + \operatorname{cosec}\theta = q$

$\frac{1}{\cos\theta} + \frac{1}{\sin\theta} = q$

$\frac{\sin\theta + \cos\theta}{\sin\theta\cos\theta} = q$

$\frac{\sin\theta + \cos\theta}{\frac{p^2-1}{2}} = q$ (by ②)

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

$$p = \frac{q(p^2-1)}{2}$$

$$\boxed{2p = q(p^2-1)} \quad //$$

hence proved //

by myself