

GLOBAL TALENT SEARCH EXAMINATION

MATHEMATICS

Class : IX

Max Marks : 80

Time : 9:00 to 10:30 a.m.

Instructions to Candidates :

01. This question paper has 40 objective questions. In addition to this question paper, you are also given an answer-sheet.
02. Read the instructions carefully for each section before attempting it.
03. For each correct answer **2 marks** will be awarded and there is no negative marking.
04. On the answer-sheet, fill up all the entries carefully in the space provided, **ONLY IN BLOCK CAPITAL LETTERS.**
05. Incomplete / incorrect / carelessly filled information may disqualify your candidature.
06. On the answer-sheet, use **PENCIL / BLUE or BLACK BALL PEN.**
07. No extra sheet will be provided for rough-work. Use the space available in the paper for your rough- work.
08. Use of calculator is not permitted.
09. No student is permitted to leave the examination hall before time is complete.
10. Use of unfair means shall invite cancellation of the test.

Roll No.

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Male / Female _____

Name of the candidate : (In English only, as you would like it to be printed on the certificate).

Signature of the
invigilator

Signature of
the candidate

AMITY INSTITUTE FOR COMPETITIVE EXAMINATIONS

DELHI CENTRES: • E-25, Defence Colony, New Delhi - 110024. Ph.: 011-24336143/44, 24331000-02.

WEST DELHI : • B-1/632, Main Nazafgarh Road, Janakpuri, New Delhi - 110058. Ph.: 011-25573111/12/13/14.

EAST DELHI : • Amity International School, Mayur Vihar, Phase-I, Ext., Delhi, Ph.: 011-22710588.

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Rough Work

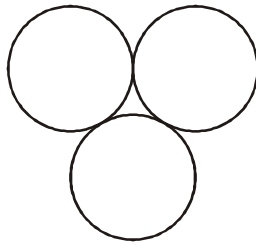
4. Three identical circles, each of radius r are placed very closely, each circle touching the other two, as shown below. The area enclosed by the circles is

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

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

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

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



In the following questions, each series follows its own regular pattern of numbers. Try to understand the pattern of numbers in each series and then find the missing number, which is also given as one of the four alternatives below each series.

5. 7, 14, 28, 49, 77, ...?..., 154

(A) 112

(B) 108

(C) 105

(D) 119

6. 3, 6, 11, 18, 27, 38, ...?...

(A) 55

(B) 53

(C) 51

(D) 49

7. A room is 7 m long and 5 m broad and the doors and windows in its walls occupy 5 m^2 . The cost of covering the remaining surface of the walls with fancy paper 75 cm wide, at the rate of Rs. 84 per piece of 13 m, is Rs. 784. Find the height of the room

(A) 4.5 m

(B) 4.0 m

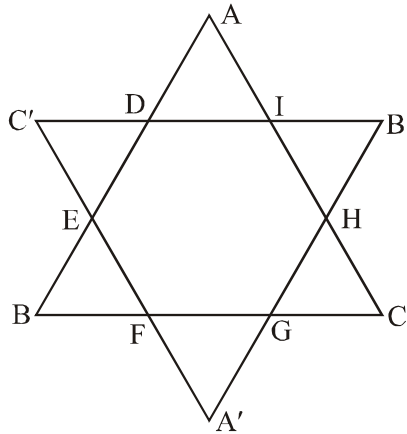
(C) 3.5 m

(D) 3.0 m

Rough Work

8. Equilateral triangles ABC and $A'B'C'$ are so placed that a regular hexagon $DEFGHI$ is formed as their common area, shown below. If area of each equilateral triangle is $9\sqrt{3}$ sq. cm, then the area of the hexagon $DEFGHI$ is

- (A) $9\sqrt{3}$ sq cm
 (B) $8\sqrt{3}$ sq cm
 (C) $6\sqrt{3}$ sq cm
 (D) $9\sqrt{2}$ sq cm



9. What is the remainder when $27x^3 - 9x^2 - 3x + 8$ is divided by $3x + 2$?
- (A) + 2 (B) - 2
 (C) + 4 (D) - 4

In the following questions, the numbers in the cells of each square follow some rule. Find the number, which when replaced by the symbol ..?.., maintains the same rule.

10. (A) 26
 (B) 19
 (C) 17
 (D) 10

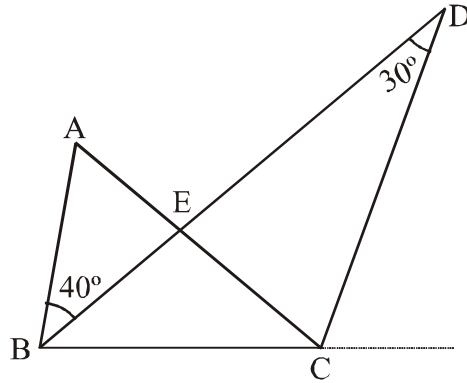
| | | |
|----|----|-------|
| 25 | 29 | 18 |
| 10 | 14 | 8 |
| 27 | 30 | ..?.. |

11. (A) 90
 (B) 88
 (C) 86
 (D) 84

| | | |
|----|----|-------|
| 18 | 22 | 29 |
| 33 | 40 | 53 |
| 57 | 62 | ..?.. |

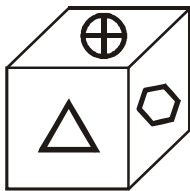
Rough Work

15. ABC is a triangle in which the bisector of $\angle B$ and the bisector of exterior $\angle C$ meet at a point D such that $\angle BDC = 30^\circ$. If $\angle ABD = 40^\circ$, then $\angle ACD$ and $\angle BAC$ are, respectively, equal to

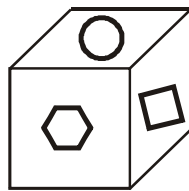


- (A) 75° and 65° (B) 60° and 70°
 (C) 65° and 60° (D) 70° and 60°

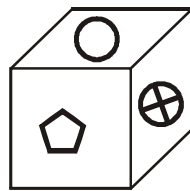
Three views of a cube are given below. Study each view of the cube and answer the following two questions.



1



2



3

16. In figure 2, the symbol opposite to \square is

- (A) \oplus (B) \pentagon
 (C) \triangle (D) difficult to find

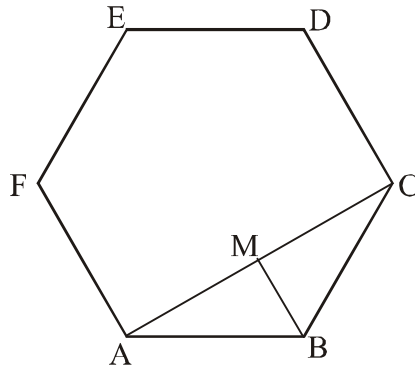
17. In figure 3, the symbol opposite to \bigcirc is

- (A) \hexagon (B) \square
 (C) \triangle (D) difficult to find

Rough Work

22. Each side of a regular hexagon has a length of $\sqrt{3}$ cm. If $BM \perp AC$ (as shown), then area of triangle AMB is closer to

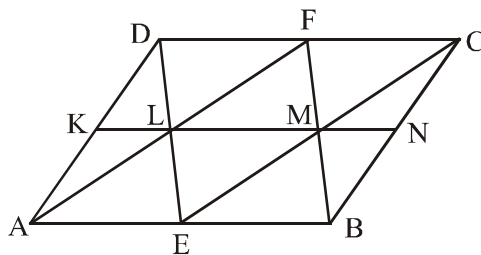
- (A) 0.65 cm^2
 (B) 0.72 cm^2
 (C) 0.68 cm^2
 (D) 0.75 cm^2



23. The sides of a rectangle are in the ratio 5 : 4. If the length of the rectangle is increased by 1 cm, but its breadth is decreased by 1 cm, then area of the rectangle decreases by 3.9 cm^2 . The length of the rectangle is

- (A) 15.5 cm (B) 15.0 cm
 (C) 14.5 cm (D) 14.0 cm

24. $ABCD$ is a parallelogram in which E and F are the mid-points of sides AB and CD , respectively. The mid-points E and F are connected to the corners of the parallelogram, as shown. If A is the area of quadrilateral $AECF$ then tick-mark(\surd) the *wrong* statement.

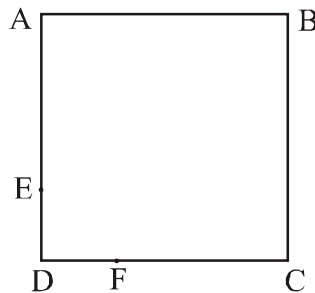


- (A) Area of triangle ALD is $A / 4$
 (B) Area of triangle EMB is $A / 4$
 (C) Area of triangle ABF is A
 (D) Area of the quadrilateral $FLNC$ is $3A / 4$

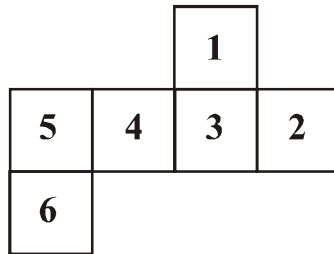
Rough Work

25. $ABCD$ is a square in which $DF = 2$ cm. If $AE = 2 DF$ and $CF = AE$, then the area of the quadrilateral $BEDF$ would be equal to

- (A) 15.0 cm^2
- (B) 13.5 cm^2
- (C) 12.0 cm^2
- (D) 9.0 cm^2



26. The following spread of paper is folded along the lines to form a cube.



Which one of the following statements is *not* correct ?

- (A) Numbers 5 and 3 are on opposite faces
 - (B) Numbers 5 and 1 are on opposite faces
 - (C) Numbers 2 and 1 are on adjoining faces
 - (D) Numbers 4 and 2 are on opposite faces
27. The following series follows a regular pattern. Try to understand the pattern of the series

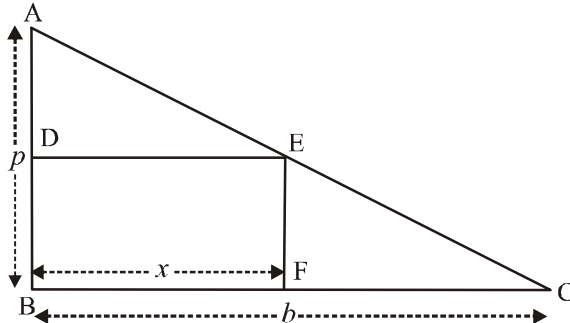
3, 7, 10, 17, 27, 44, ..?.., ..?..

The next two numbers of the series are

- (A) 81, 125
- (B) 73, 115
- (C) 71, 105
- (D) 71, 115

Rough Work

28. A right angled triangle ABC has base b and perpendicular p . A rectangle $BDEF$ having a common angle with the triangle ABC has been inscribed in it with a side of length x , lying along the base of the triangle.



The area of the triangle EFC is

- (A) $\frac{1}{2} \frac{p}{b} (b-x)^2$ (B) $\frac{1}{2} \frac{p^2}{b} (b-x)$
- (C) $\frac{1}{2} \frac{b}{p} (b-x)^2$ (D) $\frac{1}{2} \frac{b^2}{p} (b-x)$
29. The ratio of area of the circumcircle of an equilateral triangle to that of its incircle is
- (A) 9 : 1 (B) 9 : 4
- (C) 4 : 1 (D) 2 : 1
30. Bahadur lives in a small town O . He earns his livelihood by supplying articles to shops in villages around O . Daily, he starts on his auto-rickshaw to village A towards north from his town O , at a distance of 15 km. From village A , he goes eastwards to village B , covering 20 km. Then he moves southwards to another village C , distant 5 km from village B . After taking some rest at village C , he drives his auto-rickshaw westwards for a distance of 15 km to reach village D . After some time he moves southwards to reach village E , after covering a distance of 10 km. How far away is village E from his town O ?
- (A) 5 km towards south of O
- (B) 10 km towards east of O
- (C) 5 km towards east of O
- (D) 5 km towards north of O

Rough Work

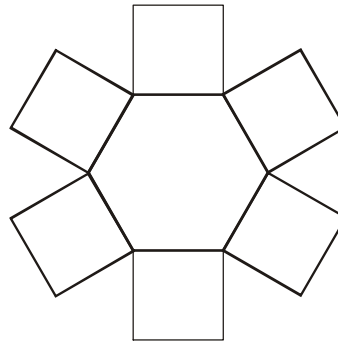
31. In the following diagram, if the perimeter of each square is 24 cm then the area of the whole shape is

(A) $54 [2 + \sqrt{3}] \text{ cm}^2$

(B) $54 [3 + \sqrt{3}] \text{ cm}^2$

(C) $54 [4 + \sqrt{3}] \text{ cm}^2$

(D) $54 [6 + \sqrt{3}] \text{ cm}^2$



32. Let $\frac{x^2 - 15}{2x - 8} = A$. If x is real then

(A) $A \leq 3$ or $A \geq 5$ (B) $3 < A < 5$

(C) $A \geq 3$ (D) $A \leq 5$

33. $x^4 + 4x^3 - x^2 - 16x - 12$, on factorisation, gives as

(A) $(x - 1)(x - 2)(x + 2)(x + 3)$

(B) $(x + 1)(x - 2)(x + 2)(x - 3)$

(C) $(x - 1)(x - 2)(x + 2)(x - 3)$

(D) $(x + 1)(x - 2)(x + 2)(x + 3)$

34. From a pack of one playing card, 2 cards are drawn. What is the probability that no queen is drawn ?

(A) $\frac{141}{169}$

(B) $\frac{144}{169}$

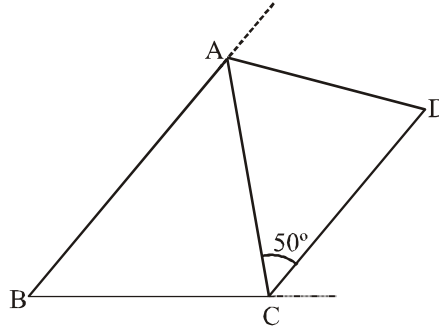
(C) $\frac{188}{221}$

(D) $\frac{192}{221}$

Rough Work

35. ABC is a triangle. The bisectors of exterior angles A and C of the triangle meet at D , forming a trapezium $ABCD$ in which $BA \parallel CD$. If $\angle ACD = 50^\circ$, then $\angle ADC$ is equal to

- (A) 70°
- (B) 65°
- (C) 60°
- (D) 55°



36. Two adjacent sides of a parallelogram are, respectively, 13 cm and 17 cm in length. If the length of the diagonal passing through their point of intersection is 20 cm, then area of the parallelogram is closest to (take $\sqrt{30} = 5.5$)

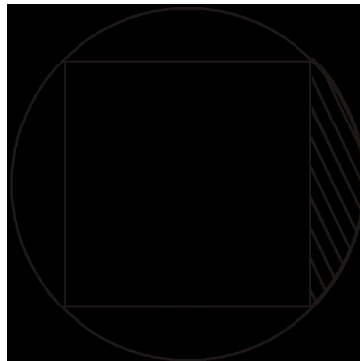
- (A) 200 cm^2
- (B) 220 cm^2
- (C) 230 cm^2
- (D) 240 cm^2

37. How many diagonals can be drawn in a regular hexagon (six sided figure in a plane) ?

- (A) 15
- (B) 12
- (C) 9
- (D) 8

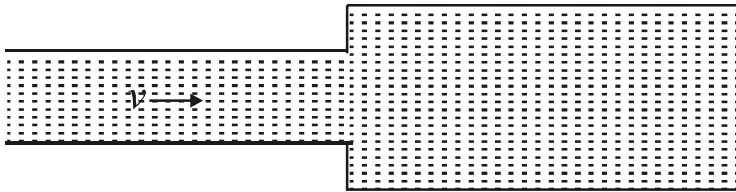
38. A square of maximum area is inscribed in a circle of radius 4.2 cm. Area of the one of the four secants (shown shaded) is nearly equal to

- (A) 4.2 cm^2
- (B) 5.04 cm^2
- (C) 5.60 cm^2
- (D) 6.02 cm^2



Rough Work

39. A liquid is flowing with speed v through a horizontal pipe of cross-sectional area A . On entering the other pipe of double the radius, the speed of the liquid would



- (A) become $v/8$ (B) become $v/2$
(C) become $v/4$ (D) remain v
40. A cube of maximum volume is cut from a sphere. Find the ratio of the masses of the cube and the original sphere.
- (A) $3 : 2\pi$ (B) $3 : \sqrt{6} \pi$
(C) $3 : \sqrt{2} \pi$ (D) $2 : \sqrt{3} \pi$

ANSWERS : CLASS IX MATHS

| | | | | | | | | | |
|----|---|----|---|----|---|----|---|----|---|
| 1 | D | 2 | B | 3 | A | 4 | C | 5 | A |
| 6 | C | 7 | B | 8 | C | 9 | B | 10 | B |
| 11 | B | 12 | C | 13 | B | 14 | D | 15 | D |
| 16 | A | 17 | C | 18 | B | 19 | B | 20 | D |
| 21 | C | 22 | A | 23 | C | 24 | D | 25 | C |
| 26 | B | 27 | D | 28 | A | 29 | C | 30 | C |
| 31 | C | 32 | A | 33 | D | 34 | C | 35 | B |
| 36 | B | 37 | C | 38 | B | 39 | C | 40 | D |