SAMAGRA PLUS

ANNUAL EXAMINATION 2025 - PRACTICE QUESTION PAPER

MATHEMATICS

Time : $2\frac{1}{2}$ hrs **STD IX** **Score : 80**

Answer any 3 questions from 1 to 4. Each question carries 2 scores.

1) Sum of the first 5 odd numbers is 25.

(a) What is the mean of these numbers?

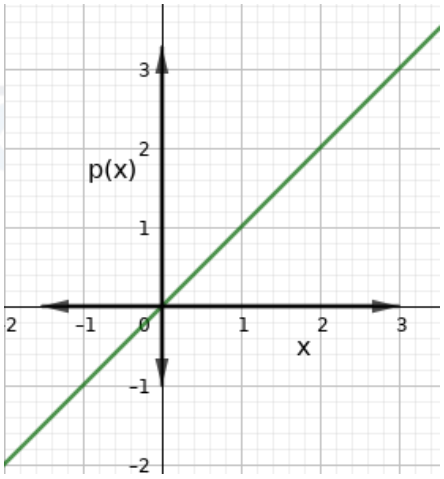
(b) What is the mean of first 5 even numbers?

2) When a square is scaled, both its sides and diagonals change. If d stands for diagonal and a for side then,

(a) Write d in terms of a?

(b) Are they proportional? if so what is the proportionality constant.

3) Graph of a polynomial is given below.



(a) Write the polynomial.

(b) What is $p(2)$?

4) Base perimeter of a square prism is 12cm, height 10cm.

(a) What is the lateral area?

(b) Find the volume of the prism.

Answer any 4 questions from 5 to 10. Each question carries 3 scores

5) One third of the sum of two numbers is 14. Half of their difference is 4.

(a) Write the equations using the above facts.

(b) Find the numbers.

6) Sides of a rectangle are $\sqrt{2}+1$ and $\sqrt{2}-1$.

(a) Find the approximate perimeter of the rectangle in two decimal places.

(b) What is the area of the rectangle?

7) x and y are two odd integers such that $x \times y = 1533$ and $x - y = 52$

(a) What are the even integers just above x and just below y.

(b) Find the product of these even integers?

8) Perimeter of a square is 24cm. A quarter circle is drawn with one vertex as centre and side of the square as radius.

(a) What is the length of its side?

(b) What is the area of quarter circle?

(c) Calculate area of the shaded part.

9) Let x be a real number. $|\ x-2\ | = 7$.

(a) What does this equation mean?

(b) What are the numbers satisfying this equation?

(c) What is the distance between these real numbers?

10) 5 rupee notes and 10 rupee notes costs 100 rupees .Total number of notes is 12.

(a) Write two equations by taking number of 5 rupee notes and number of 10 rupee notes as x and y.

(b) Find the number of notes of each denomination.

Answer any 8 questions from 11 to 21. Each question carries 4 scores

11) The table shows the rainfall and days in a month. Calculate mean rainfall.

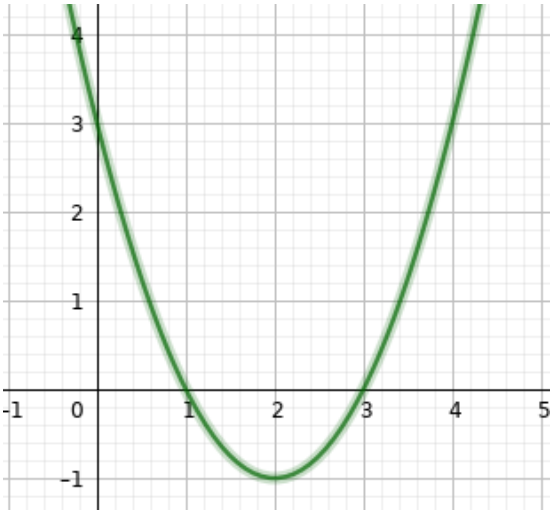
Rainfall (mm)	Days
54	3
56	5
58	8
55	3
50	2
47	4
44	5
Total	30

12) A wheel of radius 50cm rolls along a straight road.

(a) What distance it moves in one rotation?

(b) Does the distance travelled by the wheel proportional to number of rotation? If so, what is proportionality constant?

13) Graph of the polynomial $p(x) = ax^2 + bx + c$ is given below.



(a) What is $p(1), p(3)$ and $p(0)$ shown in the picture?

(b) What is c ?

(c) Write the polynomial.

14) Area and circumference of a circle are equal numerically(same number).

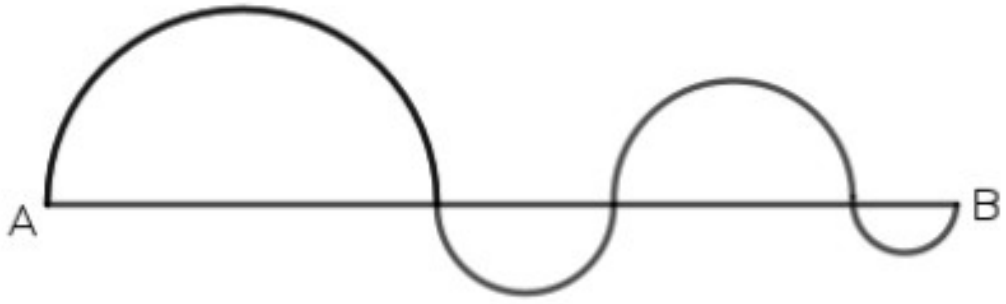
(a) What is the radius ?

(b) Find its area or circumference.

(c) What is the perimeter of the largest square drawn with vertices on this circle.

15) AB is a line of length 36cm .Semicircles are drawn with diameter on AB.

Radii of the semicircles are r_1, r_2, r_3, r_4.



(a) What is $r_1 + r_2 + r_3 + r_4$?

(b) What is the total length of the arcs?

(c) If the radii are equal then what is the total length of the arcs.

16) $a(x)$ is the polynomial representing the area of a rectangle with sides $2x+1, x-1$.

(a) Write $a(x)$.

(b) If $x=2$ then what is the area of the rectangle ?

17) Let x be a real number.

(a) What is the meaning of $|\ x-1\ |=1$?

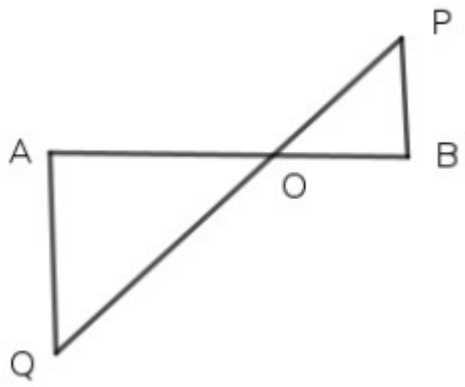
(b) If $|\ x+1\ |=|\ x-1\ |$ then what is x ?

(c) Prove that $|\ x\ |^2=x^2$

18) Draw a square of side 3cm. By joining mid point of a side to the opposite vertices, draw a square with double the side length of the first square.

19) In the figure QA and PB are perpendicular to AB.

$OA=10, OB=6, PB=9$



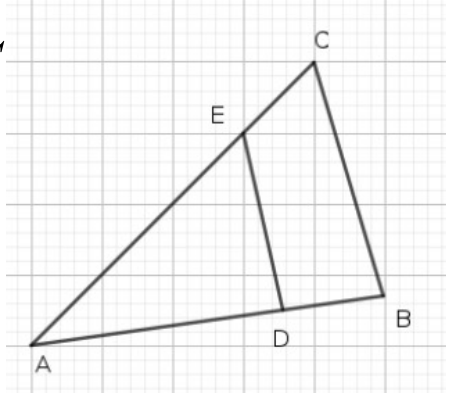
(a) Name two triangles having equal angles.

(b) Write the relation between their sides.

(c) Find AQ.

20) In the figure sides DE is parallel to BC.

$AD=x, BD=x-2, AE=x+2$ and $CE=x-1$



(a) Write the relation connecting AD, DB, AE and EC

(b) Find x.

(c) If $BC=18$ then what is the length DE ?

21) A and B are two numbers. $AB = 713, A - B = 8$

(a) Write $(A + 1)(B - 1)$ in the expanded form.

(b) Calculate the product $(A + 1)(B - 1)$

Answer any 6 questions from 22 to 29. Each question carries 5 scores

22) An equilateral triangular prism has height 20cm. End faces has perimeter 36cm each.

(a) What is the length of its base edge?

(b) What is the base area of the prism

(c) Find the volume of the prism.

23) A circular ring of radius 12πcm is cut into three equal arcs.

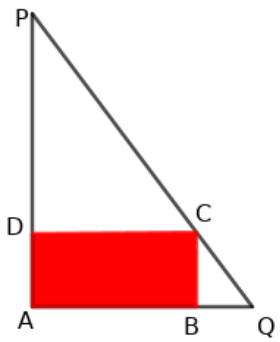
(a) What is the central angle of an arc ?

(b) What is the length of an arc ?

(c) An arc is bent as a circle. What is the radius of this circle?

(d) Calculate the area of the circle so formed.

24) $ABCD$ is a rectangle drawn inside the triangle PAQ



(a) If $\angle DPC = x$ then write $\angle PCD$, $\angle BCQ$, $\angle CQB$.

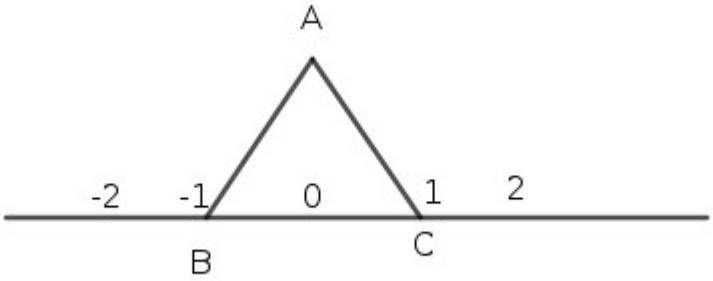
(b) If $PD = 7$cm and $QB = 1$cm then find the area of rectangle $ABCD$.

25) ABC is an equilateral triangle. Side BC coincides the number line from B to C.

(a) What is the length of the side ?

(b) What is the altitude of the triangle?

(c) Calculate the area of the triangle.

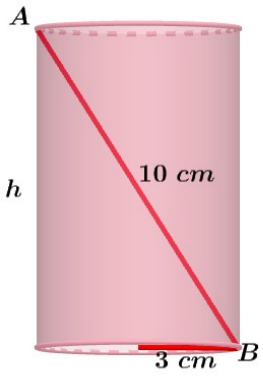


26) The maximum length of a rod that can be placed inside a cylindrical tank with a radius of 3 meters without bending is 10 meters.

(a) What is the height of the tank ?

(b) Calculate the curved surface area of the tank.

(c) Find the volume of the tank.



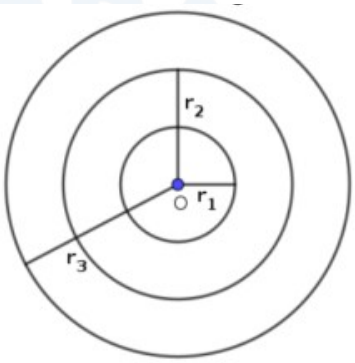
27) Three circles having same centre are given below.

Radius of the circles are in the ratio 1 : 2 : 3. The diameter of the middle circle is 18cm.

(a) What is the ratio of the perimeters?

(b) What is the perimeter of smaller circle?

(c) What is the perimeter of larger circle?



28) $p(x) = ax + b$ is a first degree polynomial.

(a) If $p(1) = 3$ then what is $a + b$?

(b) If $p(2) = 5$ then find $2a + b$?

(c) Calculate a and b. Write the polynomial.

29) Look at the pattern carefully.

2^n	Number	Digit in one's place
2^1	2	2
2^2	4	4
2^3	8	8
2^4	16	6
2^5	32	2
2^6	64	4
2^7	128	8
2^8	256	6
...	...	...

Answer the questions given below

(a) Write the sequence of digits in one's place by observing the pattern.

(b) Which digit comes in the one's place of 2^{48}.

(c) Which digit comes in the one's place of 2^{50} ?

(d) What is the sum of the digits in the one's place of the numbers from 2^1 to 2^{50}

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SOLVED PRACTICE QUESTION PAPER ANNUAL EXAMINATION 2025

MATHEMATICS

Time : $2\frac{1}{2}$ hrs **STD IX** **Score : 80**

Answer any 3 questions from 1 to 4. Each question carries 2 scores

1) (a) 5

(b) 6

2) (a) $d = \sqrt{2}a$

(b) Yes . $\sqrt{2}$

3) (a) $p(x) = x$

(b) $p(2) = 2$

4) (a) 120 Sq.cm

(b) $3^2 \times 10 = 90$ cub.cm

Answer any 4 questions from 5 to 10. Each question carries 3 scores

5) Let x, y be the numbers,

(a) $x + y = 42, x - y = 8$

(b) $x = 25, y = 17$

6) (a) Perimeter $= 2 \times (\sqrt{2} + 1 + \sqrt{2} - 1) = 2 \times 2\sqrt{2} = 4 \times 1.414 = 5.656$ cm

(b) Area $= (\sqrt{2} + 1)(\sqrt{2} - 1) = (\sqrt{2})^2 - (1)^2 = 2 - 1 = 1$ Sq.cm

7) (a) $x + 1, y - 1$

(b) $(x + 1)(y - 1) = xy - x + y - 1 = xy - (x - y) - 1 = 1533 - 52 - 1 = 1480$

8) (a) $\frac{24}{4} = 6$ cm

(b) $\frac{1}{4} \times \pi \times 6^2 = 9\pi$ Sq.cm

(c) $6^2 - 9\pi = (36 - 9\pi)$ Sq.cm

9) (a) Distance from x to 2 is 7.

(b) $x = -5, 9$

(c) $\mid 9 - (-5) \mid = 14$

10) Number of 5 rupee notes $= x$

Number of 10 rupee notes $= y$

(a) $5x + 10y = 100, x + y = 12$

(b) $x = 4, y = 8$

Answer any 8 questions from 11 to 21. Each question carries 4 scores.

11)

Rainfall(mm)	Days	Total Rainfall
54	3	$54 \times 3 = 162$
56	5	$56 \times 5 = 280$
58	8	$58 \times 8 = 464$
55	3	$55 \times 3 = 165$
50	2	$50 \times 2 = 100$
47	4	$47 \times 4 = 188$
44	5	$44 \times 5 = 220$
Total	30	1579

Total Days$= 30$

Total Rainfall$= 1579$

Meadian $= \frac{1579}{30} = 52.6$ mm

12) (a) $2\pi \times 50 = 100\pi$ cm

(b) Distance $= 2\pi r \times$ number of rotations

Distance $= 100\pi \times$ number of rotations

Proportional. Proportionality constant is 100π.

13) (a) $p(1) = 0, p(3) = 0, p(0) = 3$

(b) $c = 3$

(c) $a + b = -3, 3a + b = -1, \quad a = 1, b = -4.,\ \ p(x) = x^2 - 4x + 3$

14) (a) $\pi r^2 = 2\pi r \longrightarrow r = 2$

(b) Area $= \pi \times 2^2 = 4\pi$

(c) One side of the square $= 2\sqrt{2}$. Perimeter $= 8\sqrt{2}$

15) (a) $2r_1 + 2r_2 + 2r_3 + 2r_4 = 36$

$$r_1 + r_2 + r_3 + r_4 = \frac{36}{2} = 18 \text{ cm}$$

(b) $\pi(r_1 + r_2 + r_3 + r_4) = 18\pi$ cm

(c) $\pi(r + r + r + r) = 18\pi$ cm

16) (a) $a(x) = (2x + 1)(x - 1) = 2x^2 - x - 1$

(b) $a(2) = 5$

17) (a) Distance from x to 1 is 1.

(b) $| x + 1 |$ can be written as $| x - (-1) |$.

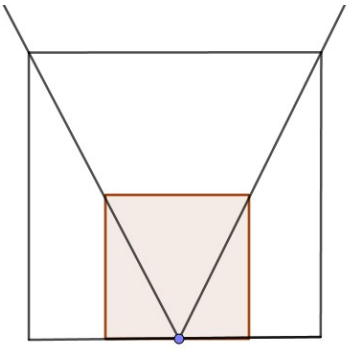
$| x - (-1) | = | x - 1 |$

Distance from x to -1 and 1 are equal. Therefore $x = 0$

(c) If $x > 0$, $| x | = x$. Thus $| x |^2 = x^2$

If $x < 0$, $| x | = -x$. Therefore $| x |^2 = (-x)^2 = x^2$

18) Construction.



19) In the figure QA and PB are perpendicular to AB. Also $OA = 10, OB = 6, PB = 9$

(a) Triangle OAQ, Triangle OBP

(b) $\frac{AQ}{PB} = \frac{OA}{OB} = \frac{OQ}{OP}$

(c) $\frac{AQ}{9} = \frac{10}{6} \rightarrow AQ = 15$

20) (a) $\frac{AD}{DB} = \frac{AE}{EC}$

(b) $\frac{x}{x-2} = \frac{x+2}{x-1} \rightarrow x = 4$

(c) $18 \times \frac{4}{6} = 12$

21) (a) $(A+1)(B-1) = AB - A + B - 1$

(b) $713 - 8 - 1 = 704$

Answer any 6 questions from 22 to 29. Each question carries 5 scores.

22) (a) 12 cm

(b) Altitude of the base $= 6\sqrt{3}$ cm

Base area $= \frac{1}{2} \times 12 \times 6\sqrt{3} = 36\sqrt{3}$ Sq. cm

(c) Volume of the prism $= 36\sqrt{3} \times 20 = 720\sqrt{3}$ Cubic.cm

23) (a) 120°

(b) $\frac{12\pi}{3} = 4\pi$ cm

(c) $r = \dfrac{4\pi}{2\pi} = 2$ cm

(d) Area $= \pi \times 2^2 = 4\pi$ Sq.cm

24) (a) $\angle PCD = 90 - x, \angle BCQ = x, \angle CQB = 90 - x$

(b) $\dfrac{PD}{BC} = \dfrac{CD}{BQ} \longrightarrow \dfrac{7}{BC} = \dfrac{CD}{1} \longrightarrow BC \times CD = 7$

Area $= BC \times CD = 7$ Sq. cm

25) (a) 2

(b) $\sqrt{3}$

(c) $\sqrt{3}$

26) (a) 8 m

(b) 48π Square metre

(c) 72π Cubic metre

27) (a) $1 : 2 : 3$

(b) 9π cm

(c) 27π cm

28) (a) $a + b = 3$

(b) $2a + b = 5$

(c) $a = 2, b = 1, p(x) = 2x + 1$

29) (a) $2, 4, 8, 6, \ldots$

(b) 6

(c) 4

(b) $(2 + 4 + 8 + 6) \times 12 + 2 + 4 = 246$