SAMAGRA PLUS

SECOND TERM SAMPLE PRACTICE PAPER

Mathematics IX

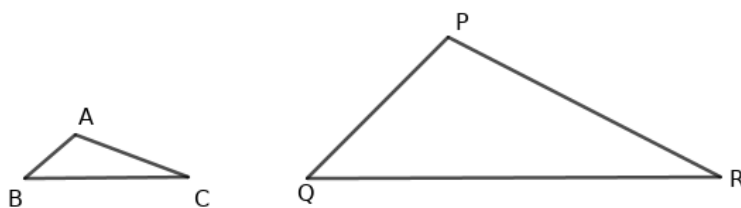Time : 2 hrs 30 min.   Score : 80

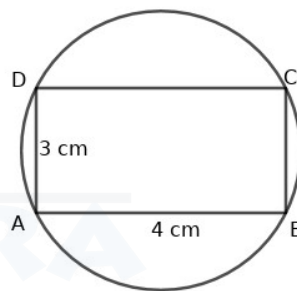■ Answer any 3 questions from 1 to 4. Each question carries 2 scores.

1) Angles of triangle ABC and PQR are equal. $\angle A = \angle P, \angle B = \angle Q$ and $\angle C = \angle R$

a) If $\dfrac{AB}{PQ} = \dfrac{1}{3}$ then what is $\dfrac{AC}{PR}$?

b) The perimeter of triangle ABC is 10 cm then what is the perimeter of triangle PQR?
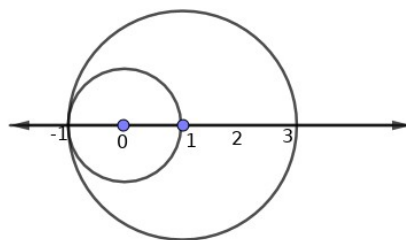
2) A circle passing through all the vertices of a rectangle $ABCD$ is drawn.

a) What is the diameter of the circle?

b) What is the circumference of the circle ?

3) Two circles having centre ,on the same number line , passing through -1. The small circle passes through 1 also.
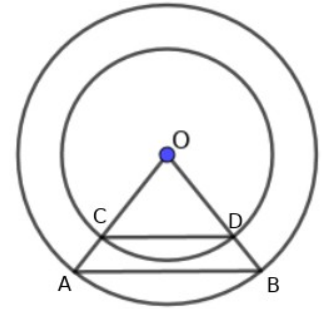

a) What is the diameter of small circle?

b) What is the diameter of the large circle?

4) Sum of two numbers is 102 and their difference is 80. Find the numbers.

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

5) In the figure O is the centre of the circles. CD is parallel to AB.

  a) Which triangles have equal angles in this diagram?

  b) If $\dfrac{OC}{OA} = \dfrac{1}{3}$ then what is the ratio of the perimeters of triangle OCD and OAB?

6) Three circles having radii in the ratio $1 : 2 : 3$ are centered the same point.

  a) What is the ratio of their diameters.

  b) If the circumference of middle circle is $12\,\text{cm}$ then what is the circumference of larger circle?

  c) What is the ratio of the their areas?

7) Distance from the number x to -1 on the number line is 7.

  a) Write this statement as an equation.

  b) What are the numbers x satisfying this equation?

  c) What is the distance between these numbers?

8) Length of one side of a rectangle is $1\,\text{cm}$ more than other side. If the length of smaller side is x then,

  a) What is the length of longer side?

  b) Write the area of the rectangle $a(x)$

 c) What will be the area if the smaller side has length $5\,\text{cm}$?

9) A circular bangle is cut into three equal pieces. Each piece is an arc of the circle. Length of one piece of the bangle is $2\pi\,\text{cm}$

  a) What will be the central angle of an arc ?

  b) What is the circumference of the bangle ?

  c) Find the radius of the bangle

10) ABC is a triangle right angled at B. $DEFB$ is a rectangle. $FC = 1\,\text{cm}$, $AD = 7\text{cm}$.

 a) Name three triangles having angles equal to one another.

  b) Write the relation between the lengths AD, DE, EF and FC.

  c) Find the area of rectangle $DEFB$.
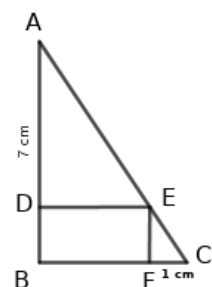
■ Answer any 8 questions from 11 to 21. Each question carries 4 scores.

11) Find the area of the triangle with sides $18\,cm$, $10\,cm$ and $14\,cm$.

12) Perimeter of square $ABCD$ is $8\,cm$. Diagonal AC is on the number line and the diagonals intersect at the point shows the number 0.
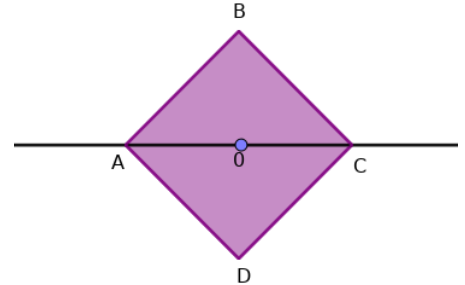
a) What is the length of its side?

b) What is the approximate length of AC .

c) What are the numbers at A and C on the number line?

[Use suitable number for approximation. $\sqrt{2} = 1.41$, $\sqrt{3} = 1.73$, $\sqrt{5} = 2.23$]

13) $p(x) = ax^2 + bx + c$ is a polynomial in which $p(1) = 0$ and $p(-1) = 8$.

a) What is $a + b + c$?

b) What is $a + c$?

c) What is b?

14) Look at the figure carefully. O is the common centre and $45°$ is the common central angle of two sectors. Given that $OA : AC = 2 : 1$ and $AC = 1\,cm$.
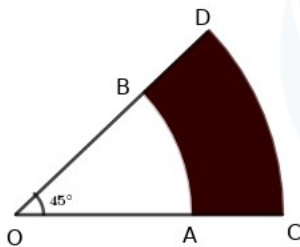
a) What part of the angle around the centre of the circle is $45°$?

b) What is the radius of both sectors ?

c) Find the area of shaded region.

15) Draw an equilateral triangle of side $3\,cm$. Construct another triangle with scale factor $1\dfrac{1}{3}$.

16) The product of two odd numbers is 1261 and the sum is 110.

a) What is the product of the even numbers just after each ?

b) What is the product of the odd numbers just after each ?

17) One side of the equilateral triangle is on the number line between -2 and 4.

a) What is the length of its side?

b) Which number comes on the mid point of side on the number line ?

c) What is the height of this triangle?

18) In the figure PQ is parallel to BC.
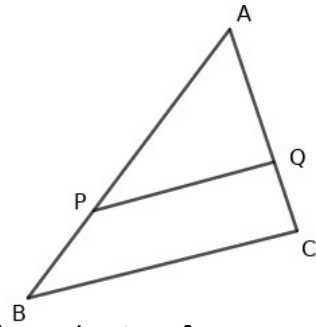
a) Name two triangles having equal angles?

b) If $AB : AP = 3 : 2$ then what is $BC : PQ$?

c) If the perimeter of triangle APQ is 20 cm then what is the perimeter of
triangle ABC?

19) Two semicircles of equal radius are drawn in a circle of diameter 4 cm.
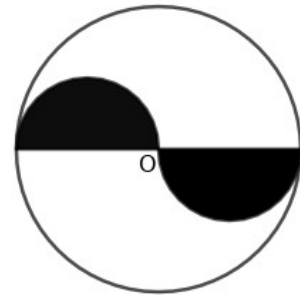
a) What is the radius of the semicircle?

b) Find the area of the coloured region.

c) Calculate the area of the unshaded region.

20)   a) Find between which numbers x should lie to satisfy the equation $|x - 1| < 2$

b) Find the integers satisfying the equation.

21) $p(x) = 3x^2 - 2x + 1$ is a polynomial.

a) What is the degree of this polynomial?

b) Find $p(1), p(-1)$ and $p(0)$.

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

22) $ABCD$ is a rectangle. Sides are 1 cm and 2 cm. CM is perpendicular to the diagonal
BD.
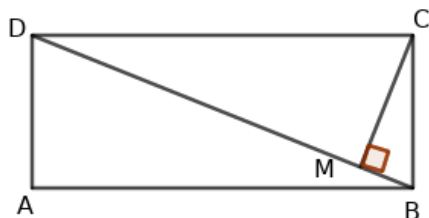
a) What is the length of the diagonal?

b) If angle $ADB = x$ then what are the angles of triangle CMB.

c) What is the area of triangle ABD.

d) Find the area of triangle BMC.

23) Two circles of radius $14\,$cm and $2\,$cm, centered at O are drawn in the figure. Another circle drawn with dots divides the area of the region in between the circles equally.
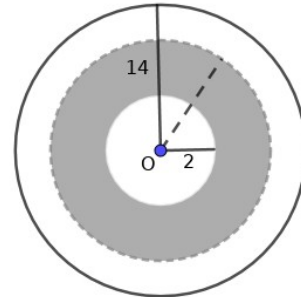
    a) Find the area of inner and outer circles?

    b) What is the area in between inner and outer circles?

    c) If the radius of the dotted circle is r then write the area of shaded part in r.

    d) Find the radius of the dotted circle.

24) A and B are two points on the number line labelling -3 and 7.

Five equilateral triangles are drawn on upper and lower side.

    a) What is the distance AB on the number line ?

    b) What is the total perimeter of equilateral triangles?

    c) If all triangles are equal then what is the length of side

25) $p(x) = ax^2 + bx + c$ and $q(x) = ax + b$ are two polynomials . $p(0) = 1, q(0) = 1$ and $p(-1) = q(-1)$.

    a) Find b and c.

    b) Calculate a.

   c) Write the polynomials $p(x)$ and $q(x)$.

26) Radius of the circular disc is shown $10\,$cm. It is divided into 8 equal sectors.

    a) What is the central angle of a sector?

    b) What is the area of a sector?

    c) Calculate the total area of shaded parts.
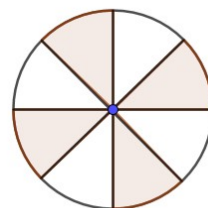
27) Draw a triangle of perimeter $11\,$cm and sides in the ratio $2:3:4$.

28) Sides of a rectangle are $12\,$cm and $6\,$cm .Four circular parts of radius $1\,$cm and centre at the corners are drawn and shaded.
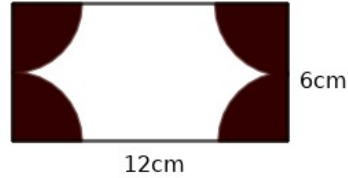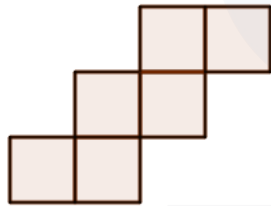

a) What is the total area of shaded part?

b) What is the area of rectangle ?

c) Find the area of unshaded part inside the rectangle.

29) Look at the pattern of squares given below . Each square has side $1\,$cm

a) What is the perimeter of the figure made by $4\,$squares?
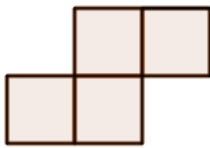
b) What is the perimeter of the figure made by $6\,$squares?

c) If there are $10\,$squares in such an arrangement then what is the perimeter of that figure?

d) What is the perimeter of the figure made by $n\,$squares?

e) How many squares in such a figure make the perimeter $46\,$cm.

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Time : 2 hrs 30 min.   **Score : 80**

ANSWERS

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

1) a) $\dfrac{1}{3}$

b) $30\,\text{cm}$

2) a) $5\,\text{cm}$

b) $5\pi\,\text{cm}$

3) a) 2

b) 4

4) 91 and 11.

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

5) a) triangle OCD and triangle OAB

b) $1 : 3$

6) a) $1 : 2 : 3$

b) 18

c) $1 : 4 : 9$

7) a) $\mid x + 1 \mid = 7$

b) $x = 6$ or $x = -8$

c) $\mid 6 - {}^-8 \mid = 14$

8) a)$(x + 1)$cm

b) $a(x) = x(x + 1) = x^2 + x$

c) $a(5) = 5^2 + 5 = 30\,\text{sq.cm.}$

9) a) $120°$

b) $6\pi\,\text{cm}$

c) $3\,\text{cm}$

10) a) triangle ABC, triangle ADE and triangle EFC.

b) $\dfrac{AD}{EF} = \dfrac{DE}{FC}$

c) $\dfrac{AD}{EF} = \dfrac{DE}{FC}$

$DE \times EF = AD \times FC$

$DE \times EF = 7 \times 1 = 7$ sq.cm

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

11) $a = 18$, $b = 10$ and $c = 14$.

$s = \dfrac{18 + 10 + 14}{2} = 21$

$s - a = 21 - 18 = 3$, $s - b = 21 - 10 = 11$, $s - c = 21 - 14 = 7$

Area $= \sqrt{s(s-a)(s-b)(s-c)}$

$= \sqrt{21 \times 3 \times 11 \times 7}$

$= 21\sqrt{11}$ sq.cm

12) a) 2 cm

b) $2\sqrt{2} = 2 \times 1.41 = 2.282$ cm

c) $-\sqrt{2}$ and $\sqrt{2}$

13) a) $a \times 1^2 + b \times 1 + c = 0 \rightarrow a + b + c = 0$.

b) $a \times (-1)^2 + b \times (-1) + c = 8 \rightarrow a - b + c = 8$

$a + b + c = 0$ and $a - b + c = 8$
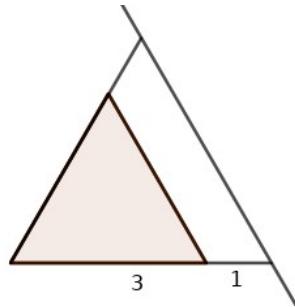
$2a + 2c = 8 \rightarrow a + c = 4$

c) $b = -4$

14) a) $\dfrac{45}{360} = \dfrac{1}{8}$

b) 2 cm and 3 cm.

c) $\dfrac{\pi \times 3^2}{8} - \dfrac{\pi \times 2^2}{8} = \dfrac{5\pi}{8}$ sq.cm.

15) Construction

16) Let x and y be two odd numbers.

$xy = 1261$ and $x + y = 110$

    a) $(x + 1)(y + 1) = xy + x + y + 1 = 1261 + 110 + 1 = 1372$

    b) $(x + 2)(y + 2) = xy + 2(x + y) + 4 = 1261 + 2 \times 110 + 4 = 1485$

17)   a) $6\,cm$

    b) 1

    c) $3\sqrt{3}$

18)   a) triangle ABC, triangle APQ

    b) $3 : 2$

    c) $30\,cm$

19)   a) $1\,cm$

    b) π sq.cm

    c) 3π sq.cm

20)   a) Between -1 and 3.

    b) $0, 1, 2$

21)   a) 2

    b) $p(1) = 2, p(-1) = 6, p(0) = 1$

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

22)   a) $\sqrt{5}\,cm$

    b) $x, 90 - x, 90$

    c) $\dfrac{1}{2} \times 2 \times 1 = 1\,$sq.cm

    d) $BD : BC = \sqrt{5} : 1,$

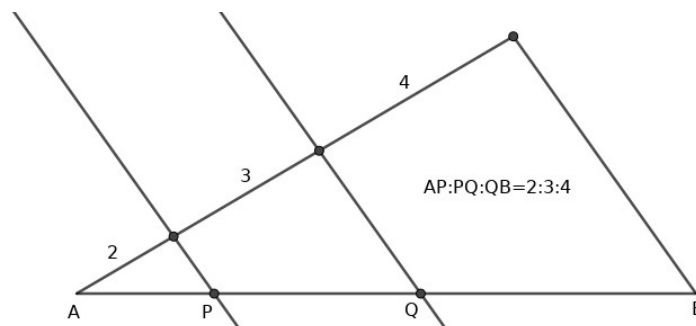   Ratio of area of triangle CMD and triangle BMC= $5 : 1$

        Area of triangle BMC= $\dfrac{1}{5}\,$sq.cm.

23) a) 4π sq.cm, 196π sq.cm

b) 192π sq.cm

c) $\pi r^2 - \pi \times 2^2 = \dfrac{192\pi}{2}$ sq.cm

$\pi r^2 - 4\pi = 96\pi$ sq.cm.

d) $\pi r^2 - 4\pi = 96\pi$

$\pi r^2 = 100\pi$

$r = 10$ cm

24) a) $AB = \mid 7 - {}^{-}3 \mid = 10$

b) $10 \times 3 = 30$

c) 2

25) a) $p(0) = 1 \rightarrow c = 1$

$q(0) = 1 \rightarrow b = 1$

b) $p(-1) = q(-1) \rightarrow a = \dfrac{1}{2}$

c) $p(x) = \dfrac{1}{2}x^2 + x + 1, \quad q(x) = \dfrac{1}{2}x + 1$

26) Radius of the circular disc is shown 10 cm. It is divided into 8 equal sectors.

a) $\dfrac{360°}{8} = 45°$

b) $\dfrac{1}{8} \times \pi \times 10^2 = \dfrac{100\pi}{8}$ sq.cm

c) $\dfrac{100\pi}{8} \times 4 = 50\pi$ sq.cm

27) Construction

AP:PQ:QB=2:3:4

28)   a) π sq.cm.

   b) 72 sq.cm

   c) $(72 - \pi)$ sq.cm

29) Look at the pattern of squares given below . Each square has side $1\,\mathrm{cm}$

   a) 10

   b) 14

   c) $2 \times 8 + 6 = 22$

   d) $2n + 2$

   e) 22