# Mathematics

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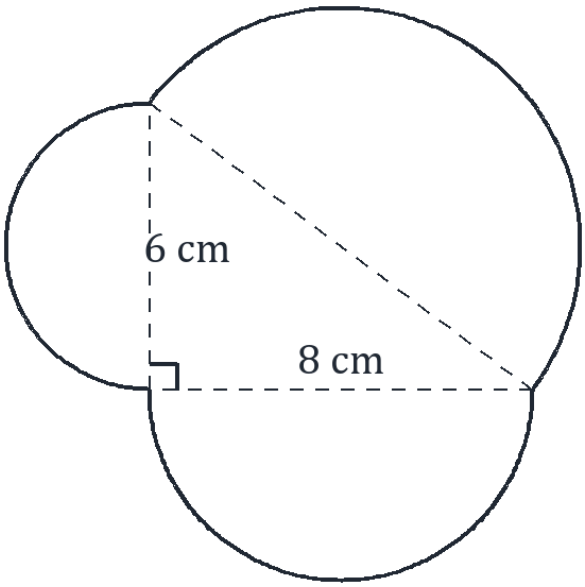
**(Chapter – 6) (Measuring Space: Perimeter and Area) (Assignment 4)**
**(Class – 9)**

Name _____ Date _____

Answer all 15 questions. Choose one option for each MCQ. Show your working. Use $\pi \approx 22/7$ unless specified otherwise. Leave answers in terms of $\pi$ when asked.

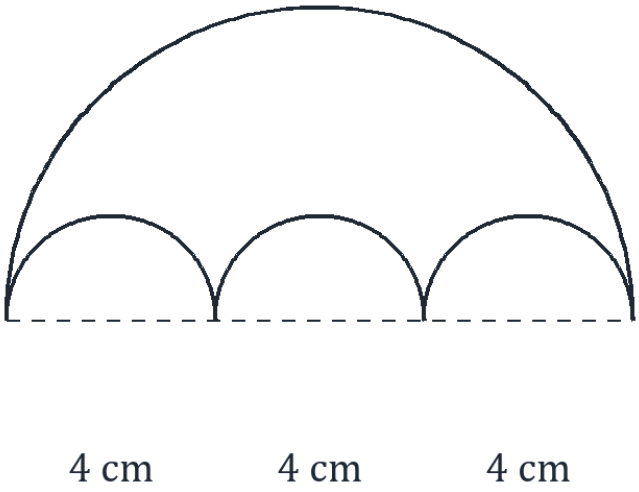
**Section A: Multiple Choice Questions**

**1.** Find the perimeters of the following shapes (taking the arcs to be quarter or half or three-quarters of a circle, as appropriate) (see figure):



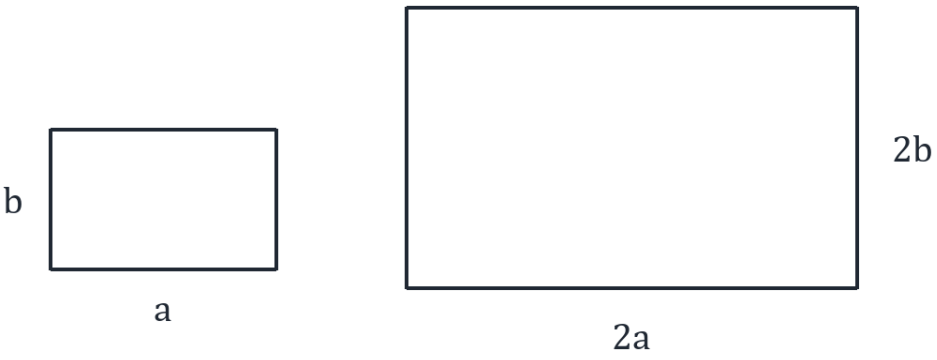

(a) $7\pi$ cm
(b) $10\pi$ cm
(c) $12\pi$ cm
(d) $24\pi$ cm

**2.** Find the perimeters of the following shapes (taking the arcs to be quarter or half or three-quarters of a circle, as appropriate) (see figure):



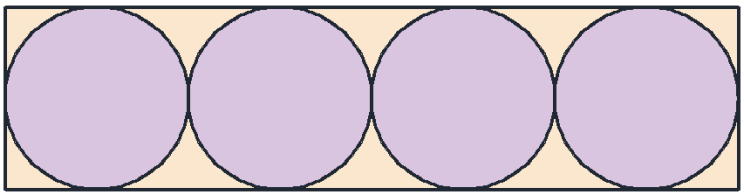

(a) $6\pi$ cm
(b) $8\pi$ cm
(c) $10\pi$ cm
(d) $12\pi$ cm

**3.** (i) Rectangle ABCD has sides a, b, and rectangle PQRS has sides 2a, 2b. Show that PQRS has 4 times the area of ABCD. Does this mean that 4 copies of rectangle ABCD will fit into rectangle PQRS? Check and see!




(a) Area doubles; four copies fit.
(b) Area quadruples; four copies fit.
(c) Area quadruples; copies do not fit.
(d) Area doubles; copies do not fit.

**4.** What fraction of the rectangle is covered by the circles?



(a) $\pi/8$
(b) $\pi/4$
(c) $1/2$
(d) $\pi/2$

**5.** Which expression gives the complete perimeter of a semicircular region of radius r?

(a) $\pi r$
(b) $2\pi r$
(c) $\pi r + 2r$
(d) $\pi r^2/2$

## Section B: Very Short Answer Questions

**6.** If the diameter of a car tyre is 56 cm, then:

(ii) How many revolutions does the tyre make if the car travels 10 km?

**Answer:**

**7.** A chord of a circle of radius 10 cm subtends 90° at the centre. Find the area of the corresponding: (ii) major sector (that subtends 270° at the centre). (Use $\pi \approx 3.14$.)

**Answer:**

**8.** Verify Brahmagupta's formula for the case of a rectangle.

**Answer:**

**9.** The area of a rectangle can be found when we know the lengths of its sides. Is the same true for a parallelogram? That is, can we find the area of a parallelogram when we know the lengths of its sides? Why or why not?

**Answer:**

**10.** An isosceles triangle has perimeter 40 cm; the equal sides are 15 cm each. Find the area of the triangle.

**Answer:**

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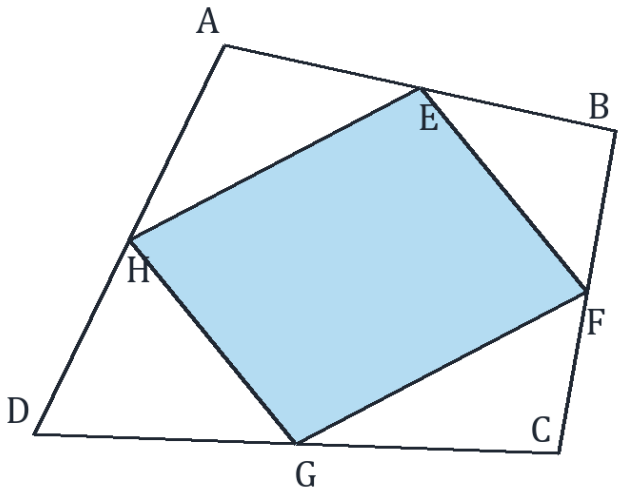
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(Class – 9)

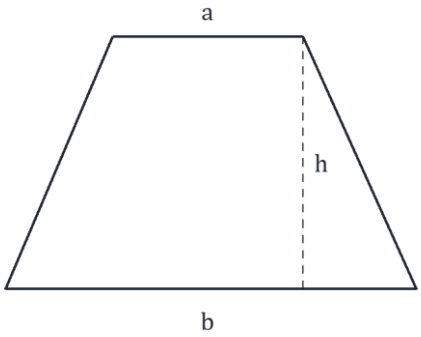
## Section C: Short and Long Answer Questions

**11.** If the mid-points of the sides of a 4-gon (also known as a quadrilateral, but we prefer to call it a '4-gon') are joined in order, prove that the area of the parallelogram thus formed will be half of the area of the given 4-gon. (You may wonder whether the 4-gon thus formed is always a parallelogram, and if so, why? These questions will be tackled and answered in the chapter on quadrilaterals.)




**Answer:**

**12.** By dividing a trapezium into two triangles show that its area is, half the sum of the parallel sides multiplied by the height (the same formula as the one given above).




**Answer:**

**13.** Two triangles share a base of length 12 cm. Each has area 42 $cm^2$. Find their perpendicular heights. Must the triangles be congruent? Explain.

**Answer:**

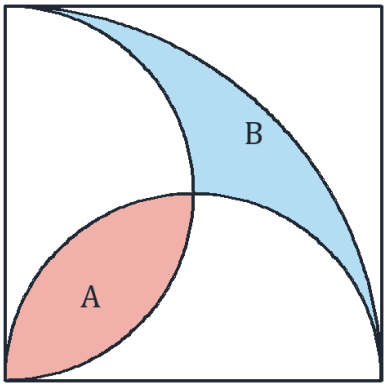
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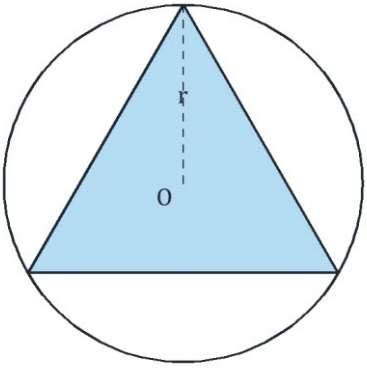
**(Class – 9)**

**14.** The figure shows a quarter circle in a square. Its centre is at one vertex, and it passes through two adjacent vertices. There are two semicircles on two adjacent sides as diameters. They create the shaded regions A and B . Show that A and B have equal area.




**Answer:**

**15.** An equilateral triangle is inscribed in a circle of radius r. Show that the ratio of the area of the triangle to the area of the circle is equal to $\frac{3\sqrt{3}}{4\pi} \approx 0.413$.




**Answer:**

# *Mathematics*

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