DELHI PUBLIC SCHOOL NEWTOWN

SESSION 2020-21

MONDAY TEST

CLASS: IX **FULL MARKS: 40**
SUBJECT: MATHEMATICS **DATE: 07. 12. 2020**

GENERAL INSTRUCTIONS:

- **The paper consists of two printed pages.**
- **All questions are compulsory.**
- **Copy the question number carefully before answering the questions.**

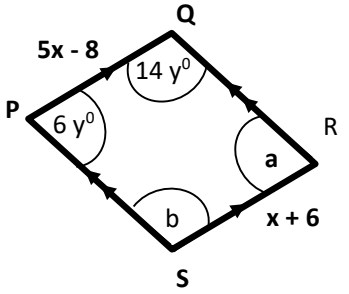
1. Two poles of heights 6m and 11m stand on a plane ground. If the distance between their feet is 12m, find the distance between their tops. [4]

2. In a quadrilateral ABCD, angle B = 90^0 = angle D. Prove that:
$2AC^2 - BC^2 = AB^2 + AD^2 + DC^2$. [4]

3. ABC is an equilateral triangle of side 2x. Prove that its altitude is $\sqrt{3}\,x$. Also find its area. [4]

4. A bicycle wheel of radius 14cm is making 25revolutions in 12secs. Find the speed of the bicycle in km/h. [4]

5. Find the values of 'x', 'y', 'a' and 'b', with reasons, in the following figure where PQRS is a parallelogram. PQ = 5x – 8 and RS = x + 6.



[4]

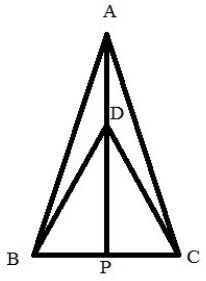
6. ABCD is a parallelogram in which AB = 2AD and P is the midpoint of AB. Prove that angle DPC = 90^0 [5]

7. In a triangle ABC, the internal bisectors of angle B and angle C meet at O. Prove that OA is also internal bisector of angle A. [5]

8. ABC and DBC are two isosceles triangles on the same base BC and vertices A and D are on the same side of BC. If AD is extended to intersect BC at P, show that:

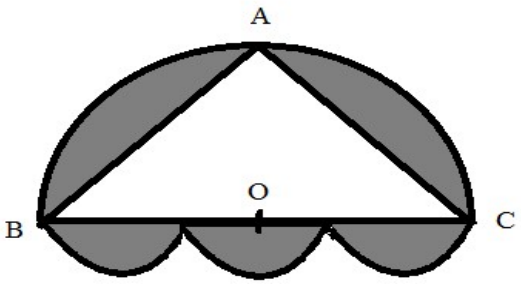
i) Δ ABD $\cong$ Δ ACD

ii) Δ ABP $\cong$ Δ ACP



[5]

9. A doorway is decorated as shown in the figure given below. There are 4 semi-circles. BC, the diameter of the larger semicircle is of length 84cm. The centres of the 3 equal semi-circles lie on BC. ABC is an isosceles triangle with AB = AC. If BO = OC, find the area of the shaded region. [Take $\pi = \frac{22}{7}$]



[5]