

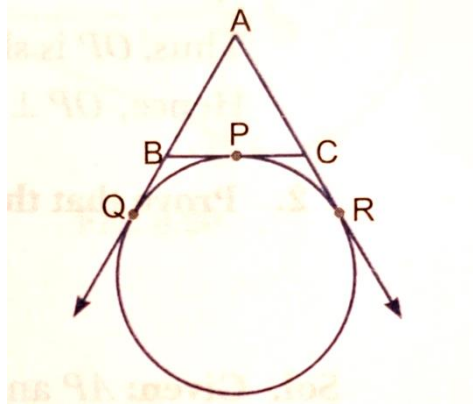
MATHEMATICS TEST –BEFORE PRE BOARD-part II
STD –X
DATE-26/11/2025

TIME 40 MIN

MM 18

(1) A circle is touching the side BC of $\triangle ABC$ at P and touching AB and AC produced at Q and R respectively.

Prove that $AQ = \frac{1}{2}$ (perimeter of $\triangle ABC$).



(2) Prove that $\left(\frac{\tan^2 A}{\tan^2 A - 1} + \frac{\operatorname{cosec}^2 A}{\sec^2 A - \operatorname{cosec}^2 A} \right) = \frac{1}{1 - 2 \cos^2 A}$

(3) At a point, the angle of elevation of a tower is such that its tangent is $\frac{5}{12}$. On walking 240 m nearer to the tower, the tangent of the angle of elevation becomes $\frac{3}{4}$. Find the height of the tower.

(4) 8 men and 12 boys can finish a piece of work in 10 days while 6 men and 8 boys can finish in 14 days. Find the time taken by one man alone and that by one boy alone to finish the work.

(5) If the sum of first p terms of an AP is q and the sum of the first q terms is p ; then show that the sum of the first $(p + q)$ terms is $\{-(p + q)\}$.

(6) In the given figure $AB = AC$. E is a point on CB produced. If AD is perpendicular to BC and EF perpendicular to AC , prove that $\triangle ABD$ is similar to $\triangle ECF$.

