



# PRAGATHI...THE SCHOOL

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**GRADE X**

**Mathematics**

**Date : 09/11/2022**

**Time Allowed: 1 Hrs**

**UNIT TEST**

**Max Marks: 30**

## **General Instructions :**

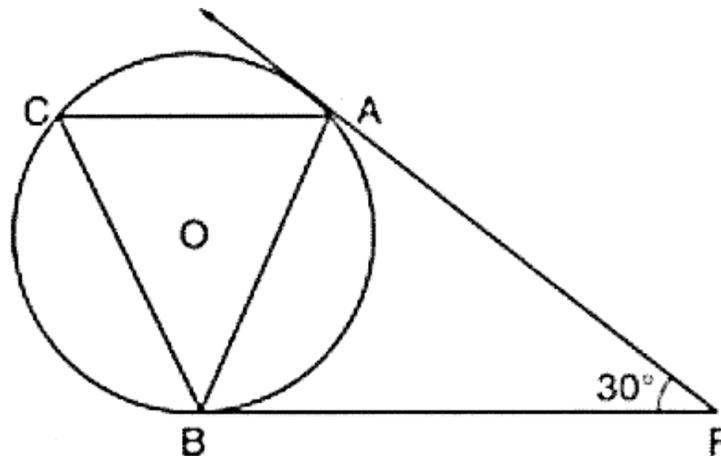
1. This Question paper contains - **five sections** A, B, C, D and E. Each section is compulsory. However, there are internal choices in some questions.
2. **Section A** has 3 **MCQ's and 01** Assertion-Reason based questions of 1 mark each.
3. **Section B** has 3 **Very Short Answer (VSA)-type** questions of 2 marks each.
4. **Section C** has 2 **Short Answer (SA)-type** questions of 3 marks each.
5. **Section D** has 2 **Long Answer (LA)-type** questions of 5 marks each.
6. **Section E** has 1 **source based/case based/passage based/integrated units of assessment** (4 marks each) with sub parts.

## **SECTION A**

**(Multiple Choice Questions)**

**Each question carries 1 mark**

1. The sum of two irrational numbers is always
  - a. a rational number
  - b. an irrational number
  - c. None of these
  - d. a rational number or an irrational number
2. The LCM of two numbers is 14 times their HCF. The sum of LCM and HCF is 600, then LCM =
  - a. 600
  - b. 480
  - c. 500
  - d. 560
3. In Figure, if tangents PA and PB are drawn to a circle such that  $\angle APB = 30^\circ$  and chord AC is drawn parallel to the tangent PB, then  $\angle ABC =$ 
  - a.  $30^\circ$
  - b. None of these
  - c.  $90^\circ$
  - d.  $60^\circ$



### ASSERTION-REASON BASED QUESTIONS

In the following questions, a statement of assertion (A) is followed by a statement of

Reason (R). Choose the correct answer out of the following choices.

- (a) Both A and R are true and R is the correct explanation of (A)
- (b) Both A and R are true but R is not the correct explanation of (A)
- (c) A is true but R is false.
- (d) A is false but R is true.

4. **Assertion (A):** If a number  $x$  is divided by  $y$  ( $x, y$ ) (both  $x$  and  $y$  are positive) then remainder will be less than  $x$ .

**Reason (R):** Dividend = Divisor Quotient + Remainder

### SECTION B

**This section comprises of very short answer type-questions (VSA) of 2 marks each**

5. Find the HCF and LCM of  $\frac{8}{9}, \frac{10}{27}$  and  $\frac{16}{81}$

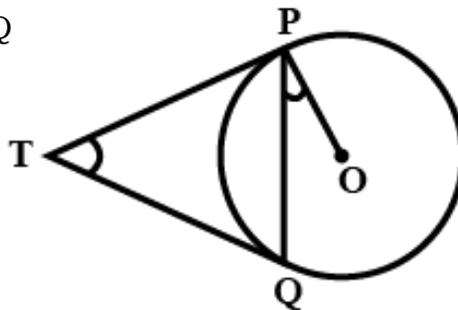
**OR**

A shopkeeper has 120 liters of petrol, 180 liters of diesel and 240 liters of kerosene. He wants to sell oil by filling the three kinds of oils in tins of equal capacity. What should be the greatest capacity of such a tin?

6. A tangent PQ at a point P of a circle of radius 5 cm meets a line through the centre O at a point Q so that OQ = 12 cm. Find the length PQ.

7. Two tangent TP and TQ are drawn to a circle with centre O from an external point T.

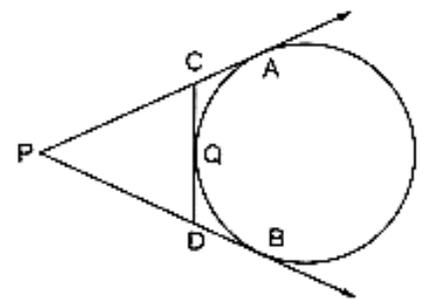
Prove that  $\angle PTQ = 2 \angle OPQ$



### SECTION C

**(This section comprises of short answer type questions (SA) of 3 marks each)**

8. In Figure, PA and PB are tangents to the circle drawn from an external point P. CD is a third tangent touching the circle at Q. If PB = 10 cm and CQ = 2 cm, what is the length PC?



**OR**

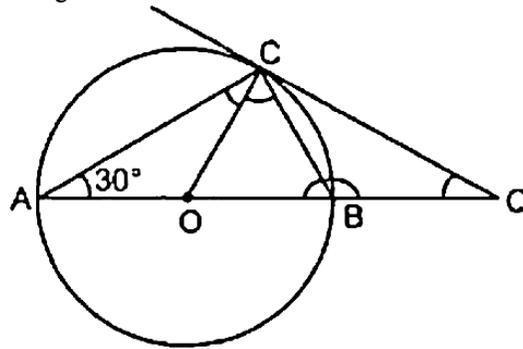
A circle touches the sides of a quadrilateral ABCD at P, Q, R, S respectively. Show that the angles subtended at the centre by a pair of opposite sides are supplementary.

9. Prove that  $\sqrt{5}$  is an irrational number

### SECTION D

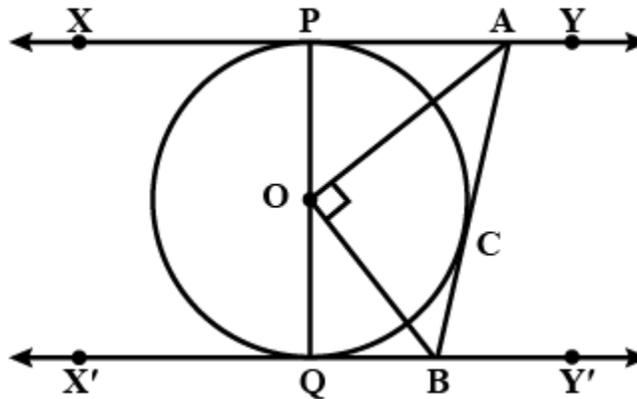
**(This section comprises of long answer-type questions (LA) of 5 marks each)**

10. In the figure, AB is diameter of a circle with centre O and QC is a tangent to the circle at C. If  $\angle CAB = 30^\circ$ , find  $\angle CQA$  and  $\angle CBA$ .



**OR**

- In the figure XY and X'Y' are two parallel tangents to a circle with centre O and another tangent AB with point of contact C intersecting XY at A and X'Y' at B prove that  $\angle AOB = 90^\circ$

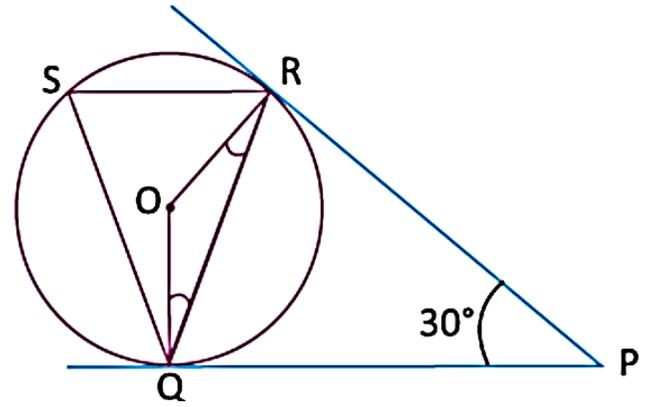
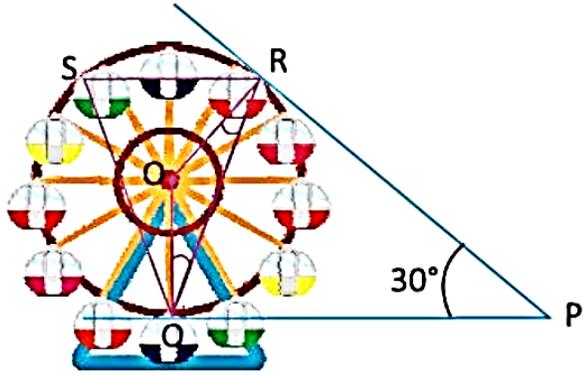


11. AB is a chord of length 24 cm of a circle of radius 13 cm. The tangents at A and B intersect at a point M. Find the length AM

### SECTION E

**(This section comprises of 1 case-study/passage-based questions of 4 marks each with two sub-parts. First two case study questions have three sub -parts (i), (ii), (iii) of marks 1, 1, 2 respectively. The third case study question has two sub-parts of 2 marks each.)**

12. **Case Study:** A Ferris wheel (or a big wheel in the United Kingdom) is an amusement ride consisting of a rotating upright wheel with multiple passengers carrying components (commonly referred to as passenger cars, cabins, tubs, capsules, gondolas, or pods) attached to the rim in such a way that as the wheel turns, they are kept upright, usually by gravity. After taking a ride in Ferris wheel, Aarti came out from the crowd and was observing her friends who were enjoying the ride. She was curious about the different angles and measures that the wheel will form. She forms the figure as given below



- i. Find  $\angle ROQ$  &  $\angle RQP$ .
- ii. Find  $\angle RSQ$  &  $\angle ORP$ .
- iii. If  $PQ=40\text{m}$  and  $OQ=30\text{m}$  then  $PO=$