

**INTERNATIONAL INDIAN SCHOOL - DAMMAM**  
**CLASS X –MATHEMATICS WORKSHEET (2024-25)**  
**REAL NUMBERS**

**MULTIPLE CHOICE QUESTIONS**

- LCM of the given number 'x' and 'y' where y is a multiple of 'x' is given by  
(a) x (b) y (c) xy (d)  $x/y$
- If  $\text{HCF}(16, y) = 8$  and  $\text{LCM}(16, y) = 48$ , then the value of y is  
(a) 24 (b) 16 (c) 8 (d) 48
- The largest number that will divide 398, 436 and 542 leaving remainders 7, 11 and 15 respectively is  
(a) 17 (b) 11 (c) 34 (d) 45
- There are 312, 260 and 156 students in class X, XI and XII respectively. Buses are to be hired to take these students to a picnic. Find the maximum number of students who can sit in a bus if each bus takes equal number of students  
(a) 52 (b) 56 (c) 48 (d) 63
- What is the greatest possible speed at which a man can walk 52 km and 91 km in an exact number of minutes?  
(a) 17 m/min (b) 7 m/min (c) 13 m/min (d) 26 m/min
- 4 bells toll together at 9.00 am. They toll after 7, 8, 11 and 12 seconds respectively. How many times will they toll together again in the next 3 hours?  
(a) 3 (b) 4 (c) 5 (d) 6

**Assertion & Reasoning**

**DIRECTION:** In the following question, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct option

- Statement A (Assertion): If product of two numbers is 5780 and their HCF is 17, then their LCM is 340  
Statement R( Reason) : HCF is always a factor of LCM  
(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)  
(b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)  
(c) Assertion (A) is true but reason (R) is false.  
(d) Assertion (A) is false but reason (R) is true.

## Subjective Questions

1. Can two numbers have 15 as their HCF and 175 as their LCM? Give reasons.
2. Prove that  $\sqrt{7}$  is irrational.
3. Given that  $\sqrt{2}$  is irrational, prove that  $(5 + 3\sqrt{2})$  is an irrational number.
4. Find LCM and HCF of the following pairs of integers and verify that  $\text{LCM} \times \text{HCF} = \text{Product of integers}$ :
  - i) 225, 240
  - ii) 510 and 92
5. Find LCM and HCF of the following pairs of integers by applying prime factorization method:
  - i) 12, 15 and 21
  - ii) 15, 24 and 36
  - iii) 240, 1024 and 1536
6. If two positive integers  $p$  and  $q$  are written as  $p=a^2b^3$  and  $q=a^3b$ ;  $a, b$  are prime numbers, then verify:  $\text{LCM}(p, q) \times \text{HCF}(p, q) = pq$ .
7. The LCM of two numbers is 64699, their HCF is 97 and one of the numbers is 2231. Find the other.
8. Explain why  $17 \times 11 \times 3 \times 2 + 11$  is a composite number.
9. The length, breadth and height of a room are 8 m 25 cm, 6 m 75 cm and 4 m 50 cm respectively. Determine the length of largest rod which can measure the three dimensions of the room exactly.
10. An electronic device makes a beep after every 60 seconds. Another device makes a beep after every 62 seconds. They beeped together at 10 a.m. At what time will they beep together at the earliest?
11. In a seminar, the number of participants in Hindi, English and mathematics are 60, 84 and 108 respectively. Find the minimum number of rooms required, if in each room, the same number of participants are to be seated and all of them being in the same subject.

### Case study based questions

Study the given Case/Passage and answer the following questions.

1. Kerosene, paraffin, or lamp oil is a combustible hydrocarbon liquid which is derivative from petroleum. Kerosene's uses vary from fuel for oil lamps to cleaning agents, jet fuel, heating oil or fuel for cooking



Two oil tankers contain 825 litres and 675 litres of kerosene oil respectively.

- a) Find the maximum capacity of a container which can measure the kerosene oil of both the tankers when used in exact number of times.
  - b) How many times the container has to be used so that both the tanker are full?
2. To enhance the reading skills of grade X students, the school nominates you and two of your friends to set up a class library. There are two sections-section A and section B of grade X. There are 32 students in section A and 36 students in section B..

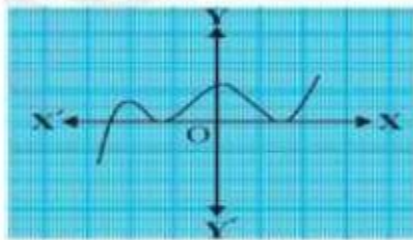


- a) What is the minimum number of books you will acquire for the class library, so that they can be distributed equally among students of Section A or Section B?
  - b) If the product of two positive integers is equal to the product of their HCF and LCM is true then, find the HCF of 32 and 36.
3. Real numbers are extremely useful in everyday life. That is probably one of the main reasons we all learn how to count and add and subtract from a very young age. Real numbers help us to count and to measure out quantities of different items in various fields like retail, buying, catering, publishing etc. Every normal person uses real numbers in his daily life. After knowing the importance of real numbers, try and improve your knowledge about them by answering the following questions on real life based situations.
- a) Three people go for a morning walk together from the same place. Their steps measure 80 cm, 85 cm, and 90 cm respectively. What is the minimum distance travelled when they meet at first time after starting the walk assuming that their walking speed is same?
  - b) In a school Independence Day parade, a group of 594 students need to march behind a band of 189 members. The two groups have to march in the same number of columns. What is the maximum number of columns in which they can march?
  - c) Pens are sold in pack of 8 and notepads are sold in pack of 12. Find the least number of pack of each type that one should buy so that there are equal number of pens and notepads

**INTERNATIONAL INDIAN SCHOOL- DAMMAM**  
**CLASS X –MATHEMATICS WORKSHEET(2024-25)**  
**POLYNOMIALS**

**MULTIPLE-CHOICE QUESTIONS (MCQ)**

- Q1. If one zero of the quadratic polynomial  $x^2 + 3x + k$  is 2, then the value of  $k$  is  
a) 10                      b) -10                      c) 5                      d) -5
- Q2. A quadratic polynomial, the sum of whose zeros is 2 and one zero is 3 is  
a)  $x^2-9$                       b)  $x^2+9$                       c)  $x^2+3$                       d)  $x^2-3$
- Q3. A quadratic polynomial, the sum of whose zeros is -5 and their product is 6 is  
a)  $x^2 + 5x + 6$                       b)  $x^2 + 5x + 6$                       c)  $x^2 - 5x + 6$                       d)  $-x^2 + 5x + 6$
- Q4. If one zero of the polynomial  $f(x) = (k^2 + 4)x^2 + 13x + 4k$  is the reciprocal of the other, then  $k =$   
a) 2                      b) -2                      c) 1                      d) -1
- Q5. If  $\alpha, \beta$  are the zeros of the polynomial  $f(x) = x^2 + x + 1$ , then  $\frac{1}{\alpha} + \frac{1}{\beta} =$   
a) 1                      b) -1                      c) 0                      d) None of these
- Q6. If  $\alpha, \beta$  are the zeros of the polynomial  $f(x) = x^2 - p(x + 1) - c$  then  $(\alpha + 1)(\beta + 1) =$   
a)  $c - 1$                       b)  $1 - c$                       c)  $c$                       d)  $1 + c$
- Q7. How many zeros are there for the given polynomial?



- a) 0                      b) 1                      c) 2                      d) 3

**Assertion Reasoning questions**

**DIRECTIONS :** Each of these questions contains an Assertion followed by Reason. Read them carefully and answer the question on the basis of following options. You have to select the one that best describes the two statements.

- a) If both Assertion and Reason are correct and Reason is the correct explanation of Assertion

- b) If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.
- c) If Assertion is correct but Reason is incorrect.
- d) If Assertion is incorrect but Reason is correct.

**1. Assertion :**  $P(x) = 4x^3 - x^2 + 5x^4 + 3x - 2$  is a polynomial of degree 3.

**Reason :** The highest power of  $x$  in the polynomial  $P(x)$  is the degree of the polynomial.

**2. Assertion :**  $x^3 + x$  has only one real zero.

**Reason :** A polynomial of  $n$ th degree must have  $n$  real zeroes.

**3. Assertion :** If one zero of poly-nominal  $p(x) = (k^2 + 4)x^2 + 13x + 4k$  is reciprocal of other, then  $k = 2$ .

**Reason :** If  $(x - a)$  is a factor of  $p(x)$ , then  $p(a) = 0$  i.e.  $a$  is a zero of  $p(x)$ .

**4. Assertion :** A quadratic polynomial, sum of whose zeroes is 8 and their product is 12 is  $x^2 - 20x + 96$ .

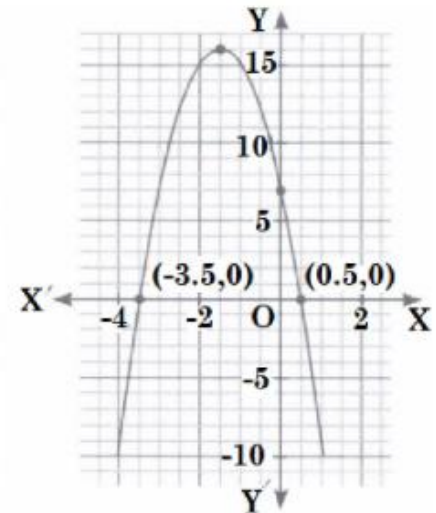
**Reason:** If  $\alpha$  and  $\beta$  be the zeroes of the polynomial  $f(x)$ , then polynomial is given by  $f(x) = x^2 - (\alpha + \beta)x + \alpha\beta$

## Subjective Questions

- Q1. Find the zeroes of the polynomial  $2x^2 - 9$  and verify the relationship between zeros and coefficients.
- Q2. Find a quadratic polynomial the sum and product of whose zeros are 3 and  $-2/5$  respectively.
- Q3. If  $\alpha$  and  $\beta$  are zeros of  $3x^2 + 5x + 13$ , then find the value of  $\frac{1}{\alpha} + \frac{1}{\beta}$ .
- Q4. Check whether  $x = -3$  is a zero of  $x^3 + 11x^2 + 23x - 35$ .
- Q5. Find  $p$  and  $q$  if  $p$  and  $q$  are the zeros of the quadratic polynomial  $x^2 + px + q$ .
- Q6. If 2 is a zero of  $2x^2 + px + 5$ , then find the value of  $p$ .
- Q7. Prove that both zeroes of  $x^2 + 99x + 127$  are negative.
- Q8. Find the quadratic polynomial sum of whose zeros is 8 and their product is 12. Hence find the zeroes of the polynomial.
- Q9. For what value of  $k$ ,  $-4$  is a zero of  $x^2 - x - (2k + 2)$ ?
- Q10. The zeroes of  $x^2 - kx + 6$  are in the ratio 3:2, find  $k$ .
- Q11. Find the zeros of the quadratic polynomial  $(5u^2 + 10u)$  and verify the relation between the zeros and the coefficients.

### Case study based questions

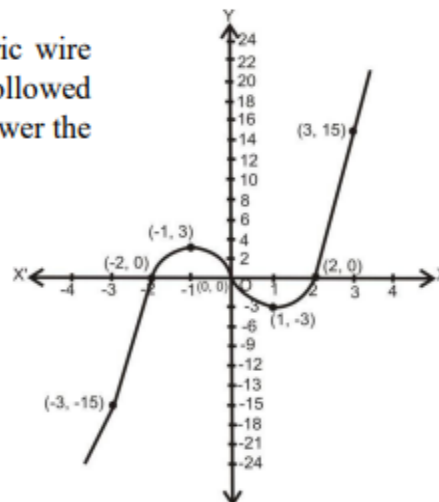
Just before the morning assembly Sachin, observes some clouds in the sky. So, he cancels the assembly. He also observes that the clouds have a shape of the polynomial. The mathematical representation of a cloud is shown in the figure. He decides to teach his students about this mathematical aspect in the nature.



Based on the above information, answer the following questions.

01. Find the zeroes of the polynomial represented by the graph.
02. What will be the expression for the polynomial represented by the graph?
03. What will be the value of polynomial represented by the graph, when  $x = 3$ ?

2. One day, due to heavy storm an electric wire got bent as shown in the figure. It followed some mathematical shape of curve. Answer the following questions below.



(a) How many zeroes are there for the polynomial (shape of the wire)

- (i) 2 (ii) 3 (iii) 4 (iv) 5

(b) Find the zeroes of the polynomial.

(i) 2, 0, -2

(ii) 2, -2, -5

(iii) -2, 2, -5.5

(iv) None of these

(c) Find the quadratic polynomial whose zeroes are -3 and 4.

(i)  $x^2 + 4x + 2$

(ii)  $x^2 - x - 12$

(iii)  $x^2 - 7x - 12$

(iv) None of these

## L – 3 Pair of linear equations in two variables

1. The pairs of equations  $x + 2y - 5 = 0$  and  $-4x - 8y + 20 = 0$  have:

- (a) Unique solution (b) Exactly two solutions (c) Infinitely many solutions (d) No solution

2. If the lines  $3x + 2ky - 2 = 0$  and  $2x + 5y + 1 = 0$  are parallel, then what is the value of  $k$ ?

- (a)  $4/15$  (b)  $15/4$  (c)  $4/5$  (d)  $5/4$

3. If a pair of linear equations is consistent, then the lines will be:

- (a) Parallel (b) Always coincident (c) Intersecting or coincident (d) Always intersecting

4. What will be the value of  $k$ , if the lines given by  $(5 + k)x - 3y + 15$  and  $(k - 1)x - y + 19$  are parallel?

- (a) 5 (b) 4 (c) 6 (d) 7

5. What will be the value of  $k$ , if the lines given by  $3x + ky - 4$  and  $5x + (9 + k)y + 41$  represent two lines intersecting at a point?

- (a)  $k \neq \frac{7}{2}$  (b)  $k \neq \frac{27}{8}$  (c)  $k = \frac{27}{8}$  (d)  $k \neq \frac{27}{2}$

6. What will be the value of  $k$ , if the lines given by  $x + ky + 3$  and  $2x + (k + 2)y + 6$  are coincident?

- (a) 4 (b) 2 (c) 6 (d) 8

**Question number 7 and 8 are Assertion and Reason question. Two statements are given, one labelled as Assertion (A) and other is labelled as Reason (R). Select the correct answer to these questions from the codes (A), (B), (C) and (D) as given below.**

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true, but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true, but reason (R) is false.

(d) Assertion (A) is false, but reason (R) is true.

**7. Assertion(A):** If the pair of lines are coincident, then we say that pair of lines is consistent and it has a unique solution.

**Reason(R):** If the pair of lines are parallel, then the pairs have no solution and is called inconsistent pair of equations.

**8. Assertion(A):** The value of  $k$  for which the system of equations  $3x + ky = 0$  and  $2x - y = 0$  has a unique solution is  $k \neq -3/2$

**Reason(R):** The graph of linear equations  $a_1x + b_1y + c_1 = 0$  and  $a_2x + b_2y + c_2 = 0$  gives a pair of intersecting lines if  $a_1/a_2 \neq b_1/b_2$ .

9. The cost of 2 kg of apples and 1kg of grapes on a day was found to be Rs.160. After a month, the cost of 4 kg of apples and 2 kg of grapes is Rs.300. Represent the situation algebraically.



10. Solve the following pair of linear equations by the substitution method.

$$\begin{aligned} \text{(i) } x + y &= 14 \\ x - y &= 4 \end{aligned}$$

$$\begin{aligned} \text{(ii) } 3x - y &= 3 \\ 9x - 3y &= 9 \end{aligned}$$

11. Solve the following pair of linear equations by the elimination method.

$$\begin{aligned} \text{(i) } 8x + 5y &= 9 \\ 3x + 2y &= 4 \end{aligned}$$

$$\begin{aligned} \text{ii) } 2x + 3y &= 8 \\ 4x + 6y &= 7 \end{aligned}$$

12. Solve the equations  $x + 2y - 4 = 0$  and  $2x + 4y - 12 = 0$  graphically.

13. Find whether the following pair of linear equations is consistent or inconsistent:

$$3x + 2y = 8; \quad 6x - 4y = 9$$

14. Draw the graph of  $2x + y = 6$  and  $2x - y + 2 = 0$ . Shade the region bounded by these lines and x axis. Find the area of the shaded region

15. Draw the graphs of the equations  $x - y + 1 = 0$  and  $3x + 2y - 12 = 0$ . Determine the coordinates of the vertices of the triangle formed by these lines and the x-axis, and shade the triangular region.

Case study based question

16. A test consists of 'True' or 'False' questions. One mark is awarded for every correct answer while  $\frac{1}{4}$  mark is deducted for every wrong answer. A student knew answers to some of the questions. Rest of the questions he attempted by guessing. He answered 120 questions and got 90 marks.

Type of Question	Marks given for correct answer	Marks deducted for wrong answer
True/False	1	0.25

1. Find a pair of linear equation in two variables. (Let the no of questions whose answer is known to the student x and questions attempted by cheating be y)

2. If answer to all questions he attempted by guessing were wrong, then how many questions did he answer correctly?

3. How many questions did he guess?

4. If answer to all questions he attempted by guessing were wrong and answered 80 correctly, then how many marks he got?

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INTERNATIONAL INDIAN SCHOOL- DAMMAM

CLASS X –MATHS (2024-25)

Quadratic equations

MULTIPLE-CHOICE QUESTIONS (MCQ)

- Which of the following is not a quadratic equation?  
(a)  $3x - x^2 = x^2 + 5$  (b)  $(x + 2)^2 = 2(x^2 - 5)$   
(c)  $(\sqrt{2}x + 3)^2 = 2x^2 + 6$  (d)  $(x - 1)^2 = 3x^2 + x - 2$
- If the equation  $4x^2 - 3kx + 1 = 0$  has equal roots then  $k = ?$   
(a)  $\pm \frac{2}{3}$  (b)  $\pm \frac{1}{3}$  (c)  $\pm \frac{3}{4}$  (d)  $\pm \frac{4}{3}$
- The roots of the equation  $2x^2 - 6x + 3 = 0$  are  
(a) real, unequal and rational (b) real, unequal and irrational  
(c) real and equal (d) imaginary
- For what values of  $k$ , the equation  $kx^2 - 6x - 2 = 0$  has real roots?  
(a)  $k \leq \frac{-9}{2}$  (b)  $k \geq \frac{-9}{2}$   
(c)  $k \leq -2$  (d) None of these
- The length of a rectangular field exceeds its breadth by 8 m and the area of the field is  $240 \text{ m}^2$ . The breadth of the field is  
(a) 20 m (b) 30 m (c) 12 m (d) 16 m

**Assertion and reasoning**

Direction: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as.

- Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
- Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
- Assertion (A) is true but reason (R) is false.

d) Assertion (A) is false but reason (R) is true.

**Q.1. Assertion:** If one root of the quadratic equation  $6x^2 - x - k = 0$  is  $\frac{2}{3}$ , then the value of  $k$  is 2.

**Reason:** The quadratic equation  $ax^2 + bx + c = 0$ ,  $a \neq 0$  has at most two roots.

**Q.2. Assertion:** The roots of the quadratic equation  $x^2 + 2x + 2 = 0$  are imaginary

**Reason:** If discriminant  $D = b^2 - 4ac < 0$  then the roots of quadratic equation  $ax^2 + bx + c = 0$  are imaginary.

### Subjective Questions

1. If  $\frac{1}{2}$  is a root of the equation  $x^2 + kx - \frac{5}{4} = 0$ , then find the value of  $k$ .
2. What will be the nature of roots of quadratic equation  $2x^2 - 4x + 3 = 0$ ?
3. Find the value of  $k$  for which the equation  $x^2 + k(2x + k - 1) + 2 = 0$  has real and equal roots.
4. If  $-5$  is a root of the quadratic equation  $2x^2 + px - 15 = 0$  and the quadratic equation  $p(x^2 + x) + k = 0$  has equal roots, then find the value of  $k$ .
5. Find the value of  $c$  for which the quadratic equation  $4x^2 - 2(c + 1)x + (c + 1) = 0$  has equal roots, which are real.
6. A two digit number is four times the sum of the digits. It is also equal to 3 times the product of digits. Find the number.
7. Solve the following quadratic equations by the factorisation method.
  - a.  $3(x^2 - 4) = 5x$
  - b.  $3x^2 - 2\sqrt{6}x + 2 = 0$
  - c.  $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$
  - d.  $2x^2 - 2x + \frac{1}{8} = 0$
8. Find the roots of the following quadratic equations by applying the quadratic formula
  - a.  $4x^2 + 4\sqrt{3}x + 3 = 0$
  - b.  $p^2x^2 + (p^2 - q^2)x - q^2 = 0$
  - c.  $x^2 + 5x - (a^2 + a - 6) = 0$
  - d.  $abx^2 + (b^2 - ac)x - bc = 0$
9. Find the nature of the roots of the following quadratic equation. If the real roots exist, find them:  $3x^2 - 4\sqrt{3}x + 4 = 0$
10. If the equation  $(1 + m^2)x^2 + 2mcx + c^2 - a^2 = 0$  has equal roots, show that  $c^2 = a^2(1 + m^2)$ .

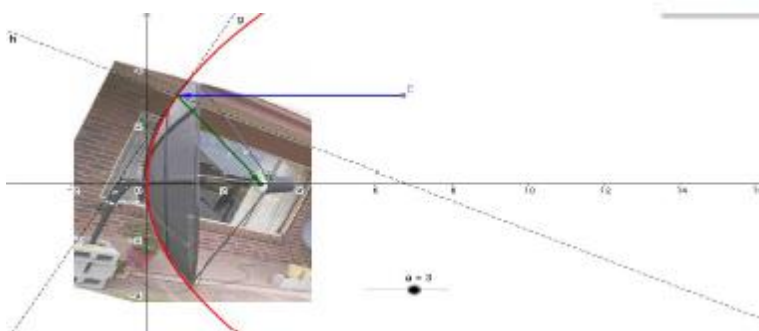
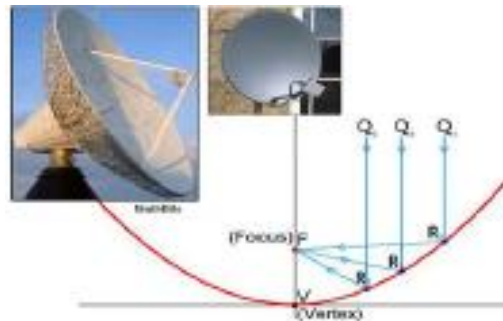
11. If  $\sin\theta$  and  $\cos\theta$  are roots of the equation  $ax^2 + bx + c = 0$ , prove that  $a^2 - b^2 + 2ac = 0$ .
12. A bus travels at a certain average speed for a distance of 75 km and then travels a distance of 90 km at an average speed of 10 km/hr more than the first speed. If it takes 3 hours to complete the total journey, find its original speed.
13. Seven years ago Varun's age was five times the square of Swati's age. Three years hence, Swati's age will be two-fifth of Varun's age. Find their present ages.
14. In a rectangular park of dimensions  $50\text{ m} \times 40\text{ m}$ , a rectangular pond is constructed so that the area of grass strip of uniform width surrounding the pond would be  $1184\text{ m}^2$ . Find the length and breadth of the pond.
15. The difference of squares of two numbers is 88. If the larger number is 5 less than twice the smaller number, then find the two numbers.

### Case study questions

To transmit a signal, a controller sends it through the horn, and the dish focuses the signal into a relatively narrow beam. When the signal reaches the viewer's house, it is captured by the satellite dish.

A satellite dish is just a special kind of antenna designed to focus on a specific broadcast source. The standard dish consists of a parabolic (bowl-shaped) surface and a central feed horn. To transmit a signal, a controller sends it through the horn, and the dish focuses the signal into a relatively narrow beam.

The parabolic shape is due to the quadratic polynomial which is in the standard form  $P(x) = ax^2 + bx + c$



1. If the zeroes of the quadratic polynomial representing the curve of dish are  $-5$  and  $-6$  then find the polynomial
2. If  $\alpha$  and  $\beta$  are the zeroes of the polynomial  $p(x) = x^2 - px + 36$  and  $\alpha^2 + \beta^2 = 9$ , find the value of  $p$
3. If the polynomial representing the curve is  $p(x) = x^2 + \frac{x}{6} + \frac{1}{5}$  then find the factors of the polynomial.

2. Raj and Ajay are very close friends. Both the families decide to go to Ranikhet by their own cars. Raj's car travels at a speed of  $x$  km/h while Ajay's car travels  $5$  km/h faster than Raj's car. Raj took  $4$  hours more than Ajay to complete the journey of  $400$  km.



- (i) What will be the distance covered by Ajay's car in two hours?
- (ii) Which of the following quadratic equation describe the speed of Raj's car?
  - (a)  $x^2 - 5x - 500 = 0$
  - (b)  $x^2 + 4x - 400 = 0$
  - (c)  $x^2 + 5x - 500 = 0$
  - (d)  $x^2 - 4x + 400 = 0$
- (iii) What is the speed of Raj's car? How much time Ajay took to travel  $400$  km?

**INTERNATIONAL INDIAN SCHOOL- DAMMAM**

**CLASS X –MATHS (2024-25)**

**ARITHMETIC PROGRESSIONS**

**Multiple choice questions**

1. The next term of the AP:  $\sqrt{8}, \sqrt{18}, \sqrt{32} \dots$  is

- (a)  $5\sqrt{2}$       (b)  $5\sqrt{3}$       (c)  $3\sqrt{3}$       (d)  $3\sqrt{5}$

2. A man receives Rs. 60 for the first week and Rs. 3 more each week than the preceding week. How much does he earn by the 20th week?

- (a) Rs. 1760      (b) Rs. 1770      (c) Rs. 1780      (d) Rs. 1790

3. The missing terms in AP:  $\_, 13, \_, 3$  are:

- (a) 11 and 9      (b) 17 and 9      (c) 18 and 8      (d) 18 and 9

4. If 17th term of an A.P. exceeds its 10th term by 7. The common difference is:

- (a) 1      (b) 2      (c) 3      (d) 4

5. What is the common difference of an AP in which  $a_{18} - a_{14} = 32$ ?

- (a) 8      (b) -8      (c) -4      (d) 4

6. Assertion: Sum of natural number from 1 to 100 is 5050

Reason: Sum of n natural number is  $n(n+1)/2$

a.) Both Assertion and Reason are correct and Reason is the correct explanation for Assertion

b.) Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion.

c.) assertion is true but the reason is false.

d.) both assertion and reason are false.

7. Assertion : The sum of the series with the nth term,  $t_n = (9 - 5n)$  is (465), when no. of terms  $n = 15$ .

Reason : Given series is in A.P. and sum of n terms of an A.P. is  $S_n = \frac{n}{2}[2a + (n-1)d]$

a.) Both Assertion and Reason are correct and Reason is the correct explanation for Assertion

b.) Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion.

c.) assertion is true but the reason is false.

d.) both assertion and reason are false.

### Subjective Questions

1. Which term of the following A.P. 27, 24, 21, .....-... is zero ?
2. If the first term of an A.P. is  $p$  and the common difference is  $q$ , then find its 10th term.
3. If  $n$ th term of an A.P. is  $(2n + 1)$ , what is the sum of its first three terms ?
4. Find the 12th term from the end of the AP:  $-2, -4, -6, \dots, -100$
5. The 4th term of an AP is zero. Prove that the 25th term is three times its 11th term.
6. The sum of the 5th and 7th terms of an AP is 52 and the 10th term is 46. Find the AP.
7. An AP consists of 50 terms of which 3rd term is 12 and the last term is 106. Find the 29th term.
8. If  $\frac{1}{x+2}, \frac{1}{x+3}$  and  $\frac{1}{x+5}$  are in AP, find the value of  $x$ .
9. Which term of the AP: 115, 110, 105, ..... is its first negative term?
10. The  $p$ th,  $q$ th and  $r$ th terms of an AP are  $a, b$  and  $c$  respectively. Show that  $a(q - r) + b(r - p) + c(p - q) = 0$ .
11. If  $m$  times the  $m$ th term of an Arithmetic Progression is equal to  $n$  times its  $n$ th term and  $m \neq n$ , show that the  $(m + n)$ th term of the AP is zero.
12. The sum of the 4th and 8th terms of an AP is 24 and the sum of the 6th and 10th terms is 44. Find the first three terms of the AP.
13. Which term of the A.P. 8, 14, 20, 26, ..... will be 72 more than its 41st term.
14. Find the number of natural numbers between 102 and 998 which are divisible by 2 and 5 both.
15. How many two digit numbers are divisible by 7 ?
16. In an A.P., if  $S_5 + S_7 = 167$  and  $S_{10} = 235$ , then find the A.P., where  $S_n$  denotes the sum of first  $n$  terms.
17. Find the middle term of the A.P. 213, 205, 197, ..... 37
18. If the sum of first  $m$  terms of an A.P. is the same as the sum of its first  $n$  terms, show that the sum of its first  $(m + n)$  terms is zero.
19. Divide 56 in four parts in A.P. such that the ratio of the product of their extremes (1st and 4th) to the product of middle (2nd and 3rd) is 5 : 6.



20. The sum of first  $n$  terms of three arithmetic progressions are  $S_1$ ,  $S_2$  and  $S_3$  respectively. The first term of each A.P. is 1 and common differences are 1, 2 and 3 respectively. Prove that  $S_1 + S_3 = 2S_2$ .
21. If the sum of the first  $n$  terms of an A.P. is  $\frac{1}{2}[3n^2 + 7n]$ , then find its  $n$ th term.  
Hence write its 20<sup>th</sup> term.
22. If  $S_n$  denotes the sum of first  $n$  terms of an A.P, prove that  $S_{30} = 3 ( S_{20} - S_{10} )$ .
23. The sum of three numbers in A.P. is 12 and sum of their cubes is 288. Find the numbers.
24. If the sum of  $m$  terms of an AP is the same as the sum of its  $n$  terms, show that the sum of its  $(m + n)$  terms is zero.
25. Find the sum of the integers between 100 and 200 that are  
(a) divisible by 9 (b) not divisible by 9
26. Find the value of  
 $5 + (-41) + 9 + (-39) + 13 + (-37) + 17 + \dots + (-5) + 81 + (-3)$ .

### **CASE STUDY**

- Thomas wants to buy a car and plans to take loan from a bank for his car. He repays his total loan of Rs 1,18,000 by paying every month starting with the first instalment of Rs 1000. If he increases the instalment by Rs 100 every month, answer the following:
  - Find the amount paid by him in 30<sup>th</sup> instalment.
  - Find the total amount paid by him after 30 instalments.
  - If total installments are 40 then amount paid in the last installment?
- Veer wants to participate in a 200 m race. Presently, he can run 200 m in 51 seconds and during each day practice it takes him 2 seconds less. He wants to do in 31 seconds.
  - Form an A P for the given situation and find out the minimum number of days he needs to practice before the day his goal is achieved?
  - Find the  $n$ <sup>th</sup> term of the A P.

INTERNATIONAL INDIAN SCHOOL- DAMMAM

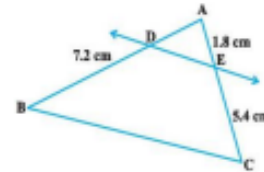
CLASS X –MATHEMATICS WORKSHEET

TRIANGLES

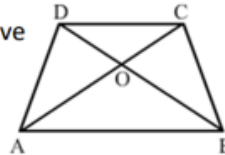
MULTIPLE-CHOICE QUESTIONS (MCQ)

1. If in two triangles ABC and DEF,  $\frac{AB}{DF} = \frac{BC}{FE} = \frac{CA}{ED}$ , then  
 (a)  $\triangle ABC \sim \triangle DEF$   
 (b)  $\triangle ABC \sim \triangle EDF$   
 (c)  $\triangle ABC \sim \triangle EFD$   
 (d)  $\triangle ABC \sim \triangle DFE$
2. If in triangle ABC and DEF,  $\frac{AB}{ED} = \frac{BC}{DF}$ , then they will be similar when  
 (a)  $\angle B = \angle E$       (b)  $\angle A = \angle D$       (c)  $\angle B = \angle D$       (d)  $\angle A = \angle F$

3. In  $\triangle ABC$ ,  $DE \parallel BC$  and  $AD = 4\text{cm}$ ,  $AB = 9\text{cm}$ ,  $AC = 13.5\text{cm}$  then the value of EC is  
 (a) 6 cm      (b) 7.5 cm      (c) 9 cm      (d) none of these
4. In figure  $DE \parallel BC$  then the value of AD is  
 (a) 2 cm      (b) 2.4 cm      (c) 3 cm      (d) none of the above

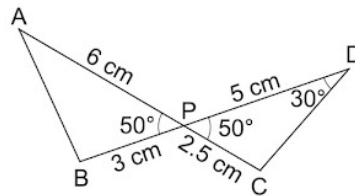


5. In the adjoining figure, ABCD is a trapezium in which  $CD \parallel AB$  and its diagonals intersect at O. If  $AO = (2x + 1)\text{ cm}$ ,  $OC = (5x - 7)\text{ cm}$ ,  $DO = (7x - 5)\text{ cm}$  and  $OB = (7x + 1)\text{ cm}$ , find the value of x.  
 (a) 2 cm      (b) 3 cm      (c) 4 cm      (d) none of the above

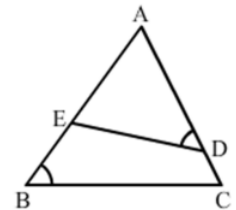


6. A street light bulb is fixed on a pole 6 m above the level of the street. If a woman of height 1.5 m casts a shadow of 3 m, find how far she is away from the base of the pole.  
 (a) 12 m      (b) 10 m      (c) 9 m      (d) 11 m
7. If  $\triangle ABC \sim \triangle DEF$ ,  $AB = 4\text{ cm}$ ,  $DE = 6\text{ cm}$ ,  $EF = 9\text{ cm}$  and  $FD = 12\text{ cm}$ , find the perimeter of  $\triangle ABC$ .  
 (a) 12 cm      (b) 14 cm      (c) 16 cm      (d) 18 cm
8. In  $\triangle ABC$ ,  $DE \parallel BC$  and  $AD/BC = 3/5$ . If  $AC = 4.8\text{ cm}$  the find the length of AE.  
 (a) 2      (b) 3      (c) 5      (d) 1.8

9. In the given figure, two line segments AC and BD intersect each other at the point P such that PA = 6 cm, PB = 3 cm, PC = 2.5 cm, PD = 5 cm,  $\angle APB = 50^\circ$  and  $\angle CDP = 30^\circ$  then  $\angle PBA = ?$



10. In the given figure, if  $\angle ADE = \angle B$ , AD = 3.8 cm, AE = 3.6 cm, BE = 2.1 cm and BC = 4.2 cm, find DE.  
 (a) 2 cm      (b) 2.5 cm      (c) 2.8 cm      (d) 3 cm



### Assertion & Reason

DIRECTIONS : Each of these questions contains an Assertion followed by Reason. Read them carefully and answer the question on the basis of following options. You have to select the one that best describes the two statements.

- If both Assertion and Reason are correct and Reason is the correct explanation of Assertion
- If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.
- If Assertion is correct but Reason is incorrect.
- If Assertion is incorrect but Reason is correct.

**1. Assertion :** D and E are points on the sides AB and AC respectively of a  $\Delta ABC$  such that  $DE \parallel BC$  then the value of x is 4, when AD = x cm, DB = (x - 2) cm, AE = (x + 2) cm and EC = (x - 1) cm.

**Reason :** If a line is parallel to one side of a triangle then it divides the other two sides in the same ratio.

**2. Assertion :** D and E are points on the sides AB and AC respectively of a  $\Delta ABC$  such that  $DE \parallel BC$  then the value of x is 11, when AD = 4cm, DB = (x - 4) cm, AE = 8cm and EC = (3x - 19) cm.

**Reason :** If a line divides any two sides of a triangle in the same ratio then it is parallel to the third side.

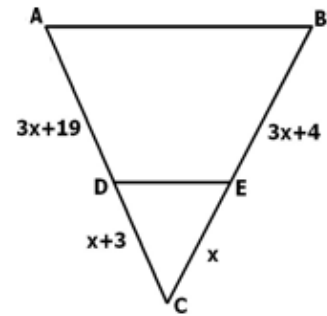
**3. Assertion :** D and E are points on the sides AB and AC respectively of a  $\Delta ABC$  such that AD = 5.7cm, DB = 9.5cm, AE = 4.8cm and EC = 8cm then DE is not parallel to BC.

**Reason :** If a line divides any two sides of a triangle in the same ratio then it is parallel to the third side.

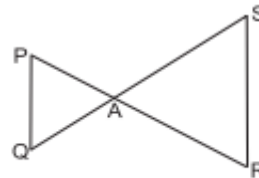
### Subjective Questions

1. P and Q are the points on the sides DE and DF of a triangle DEF such that  $DP = 5$  cm,  $DE = 15$  cm,  $DQ = 6$  cm and  $QF = 18$  cm. Is  $PQ \parallel EF$ ? Give reasons for your answer
2. If the diagonals of a quadrilateral divide each other proportionally, prove that it is a trapezium.
3. A girl of height 90 cm is walking away from the base of a lamp post at a speed of 1.2m/s. If the lamp is 3.6 m above the ground, find the length of her shadow after 4 seconds.
4. AD is a median of  $\triangle ABC$ . The bisector of  $\angle ADB$  and  $\angle ADC$  meet AB and AC in E and F respectively. Prove that  $EF \parallel BC$

5. Find the value of  $x$  for which  $DE \parallel AB$ , in the given figure.



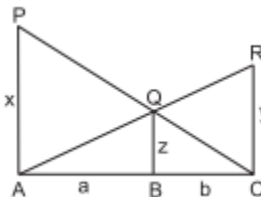
6. In the given figure,  $AP \cdot AR = AS \cdot AQ$ .  
Prove that  $\angle P = \angle S$  and  $\angle Q = \angle R$ .



7. The perimeters of two similar triangles are 25 cm and 15 cm respectively. If one side of the first triangle is 9 cm, find the corresponding side of the second triangle.

8. In the given figure  $PA$ ,  $QB$  and  $RC$  each is perpendicular to  $AC$  such that  $PA = x$ ,  $RC = y$ ,  $QB = z$ ,  $AB = a$  and  $BC = b$ .

Prove that  $\frac{1}{x} + \frac{1}{y} = \frac{1}{z}$ .



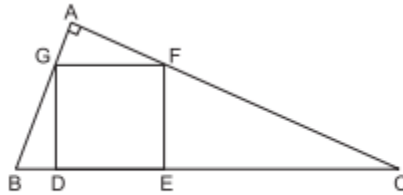
9. In a  $\triangle ABC$ ,  $AB = AC$  and  $D$  is a point on  $AC$  such that  $BC^2 = AC \times DC$ . Prove that  $BD = BC$ .

10.

In the given figure,  $DEFG$  is a square and  $\angle BAC = 90^\circ$ .

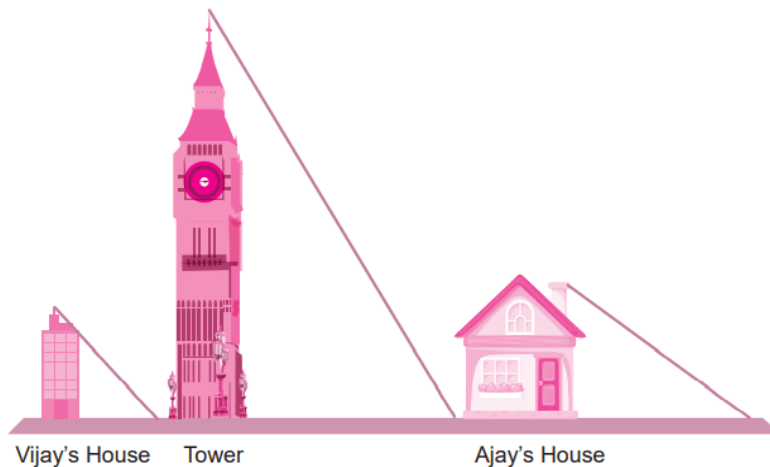
Prove that

- (i)  $\triangle AGF \sim \triangle DBG$
- (ii)  $\triangle AGF \sim \triangle EFC$
- (iii)  $\triangle DBG \sim \triangle EFC$
- (iv)  $DE^2 = BD \times EC$



### CASE STUDY QUESTIONS

Vijay is trying to find the average height of a tower near his house. He is using the properties of similar triangles. The height of Vijay's house is 20 m when Vijay's house casts a shadow 10 m long on the ground. At the same time, the tower casts a shadow 50m long on the ground and the house of Ajay casts 20 m shadow on the ground.



- (i) What is the height of the tower?
- (ii) What will be the length of the shadow of the tower when Vijay's house casts a shadow of 12m?
- (iii) When the tower casts a shadow of 40m, find the ratio of the length of the shadow of Ajay's house to the length of shadow of Vijay's house

**INTERNATIONAL INDIAN SCHOOL DAMMAM**  
**MATHEMATICS WORKSHEET GRADE-10 (2024-25)**  
**CO-ORDINATE GEOMETRY**

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- The distance of the point A (-5,6) from the origin is \_\_\_\_ units.  
(a) 5    (b) 6    (c)  $\sqrt{61}$     (d)  $\sqrt{41}$
- If the point P (2,1) lies on the line segment joining A( 4,2) and B(8,4) then  
(a)  $AP = \frac{1}{3} AB$     (b)  $AP = PB$     (c)  $PB = \frac{1}{3} AB$     (d)  $AP = \frac{1}{2} AB$
- If the distance of P(x ,y) from A( 6, 2), and B( -2, 6) are equal, then  
(a)  $x = 2y$     (b)  $y = 2x$     (c)  $y = 3x$     (d)  $x = 3y$
- The distance between the points  $(\sin\theta, -\cos\theta)$  and  $(\cos\theta, \sin\theta)$  is \_\_\_\_.  
(a)  $\sqrt{3}$     (b)  $\sqrt{2}$     (c) 1    (d) 0

**Directions:** In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

- Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
- Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
- Assertion (A) is true but reason (R) is false.
- Assertion (A) is false but reason (R) is true.

- Assertion :** The point which divides the line joining the points A(1, 2) and B(-1, 1) internally in the ratio 1: 2 is  $(\frac{-1}{2}, \frac{5}{3})$

**Reason:** The coordinates of the point P(x, y) which divides the line segment joining the points A ( $x_1, y_1$ ) and B( $x_2, y_2$ ) in the ratio  $m_1 : m_2$  is

$$\left( \frac{m_1x_2 + m_2x_1}{m_1 + m_2}, \frac{m_1y_2 + m_2y_1}{m_1 + m_2} \right)$$

- Assertion :** C is the mid-point of PQ, if P is (4, x), C is (y, - 1) and Q is (- 2, 4), then x and y respectively are -6 and 1.

**Reason :** The mid-point of the line segment joining the points P( $x_1, y_1$ ) and Q( $x_2, y_2$ ) is

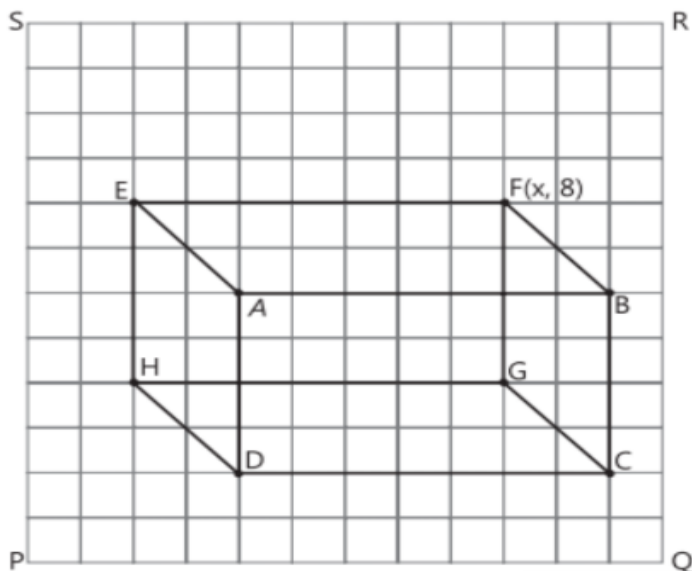
$$\left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

- Point P divides the line segment joining R(-1,3) and S(9,8) in the ratio k:1. If P lies on the line  $x - y + 2 = 0$ , find the value of k.
- If (x,y) are coordinates of the centroid of a triangle whose vertices are A(0,-2) , B ( 3,1) and C(0,4) then find x and y .
- If P  $(\frac{a}{3}, 4)$  is the mid- point of the line segment joining the points Q (-6,5) and R(-2,3) find the value of 'a'.

10. Determine the ratio in which the line  $3x+y-9=0$  divides the line segment joining the points  $(1,3)$  and  $(2,7)$ .
11. Find the coordinates of a point which lies on the perpendicular bisector of the line segment joining the points  $(-2,-5)$  and  $B(2,5)$ .
12. The vertices of a parallelogram taken in order are  $A(1,2)$ ,  $B(4,y)$ ,  $C(x,6)$  and  $D(3,5)$ . Find  $x$  and  $y$ .
13. Find the distance of the point  $(1,2)$  from the mid-point of the line segment joining the points  $(6,8)$  and  $(2,4)$ .
14. Find the fourth vertex  $D$  of the parallelogram  $ABCD$  whose three vertices are  $A(-2,3)$ ,  $B(6,7)$  and  $C(8,3)$ .
15. If the point  $P(k,0)$  divides the line segment joining the points  $A(2,-2)$  and  $B(-7,4)$  in the ratio  $1:2$ , find the value of ' $k$ '.
16. Let  $P$  and  $Q$  be the points of trisection of the line segment joining the points  $A(2,-2)$  and  $B(-7,4)$  such that  $P$  is nearer to  $A$ . Find the coordinates of  $P$  and  $Q$ .
17. Find the ratio in which the line segment joining  $(3,4)$  and  $(-2,1)$  is divided by the  $y$ -axis.
18. A line intersects the  $y$ -axis and  $x$ -axis at the points  $P$  and  $Q$  respectively. If  $(2,-5)$  is the mid-point of  $PQ$ , then find the coordinates of  $P$  and  $Q$ .

### Case study questions

According to medical science and research, keeping an aquarium in the house helps in treating stress, anxiety and health problems associated with blood. It also provides visual stimulation that boost your focus and creativity. A sketch of an aquarium is drawn, which is given in the following figure.



1. Write the coordinates of  $H$  and  $E$
  2. Find the distance of the point  $G$  from the  $Y$ -axis
  3. Find the length of diagonal  $FD$
- OR**
4. If  $Q$  is considered as origin, find the coordinates of mid-point of  $BC$

**INTERNATIONAL INDIAN SCHOOL- DAMMAM**  
**CLASS X – MATHEMATICS WORKSHEET**  
**INTRODUCTION TO TRIGONOMETRY**

**MULTIPLE-CHOICE QUESTIONS (MCQ)**

1. The value of  $(\sin 30^\circ + \cos 30^\circ) - (\sin 60^\circ + \cos 60^\circ)$  is  
(a)  $-1$  (b)  $0$  (c)  $1$  (d)  $2$
2. The value of  $\frac{\tan 30^\circ}{\cot 60^\circ}$  is  
(a)  $\frac{1}{\sqrt{2}}$  (b)  $\frac{1}{\sqrt{3}}$  (c)  $\sqrt{3}$  (d)  $1$
3. The value of  $(\sin 45^\circ + \cos 45^\circ)$  is  
(a)  $\frac{1}{\sqrt{2}}$  (b)  $\sqrt{2}$  (c)  $\frac{\sqrt{3}}{2}$  (d)  $1$
4. If  $\cos A + \cos^2 A = 1$ , then  $\sin^2 A + \sin^4 A$  is  
(a)  $-1$  (b)  $0$  (c)  $1$  (d)  $2$
5. If  $6\cot\theta + 2\operatorname{cosec}\theta = \cot\theta + 5\operatorname{cosec}\theta$ , then  $\cos\theta$  is  
(a)  $\frac{4}{5}$  (b)  $\frac{5}{3}$  (c)  $\frac{3}{5}$  (d)  $\frac{5}{4}$
6. If  $\tan A = \frac{3}{2}$ , then the value of  $\cos A$  is  
(a)  $\frac{3}{\sqrt{13}}$  (b)  $\frac{2}{\sqrt{13}}$  (c)  $\frac{2}{3}$  (d)  $\frac{\sqrt{13}}{2}$
7. If  $\sin A = \frac{1}{2}$ , then the value of  $\cot A$  is  
(a)  $\sqrt{3}$  (b)  $\frac{1}{\sqrt{3}}$  (c)  $\frac{\sqrt{3}}{2}$  (d)  $1$
8. Given that  $\sin\theta = \frac{a}{b}$ , then  $\cos\theta$  is equal to  
(a)  $\frac{b}{\sqrt{b^2 - a^2}}$  (b)  $\frac{b}{a}$  (c)  $\frac{\sqrt{b^2 - a^2}}{b}$  (d)  $\frac{a}{\sqrt{b^2 - a^2}}$
9. Given that  $\sin\alpha = \frac{1}{2}$  and  $\cos\beta = \frac{1}{2}$ , then the value of  $(\alpha + \beta)$  is  
(a)  $0^\circ$  (b)  $30^\circ$  (c)  $60^\circ$  (d)  $90^\circ$
10. If  $4\tan\theta = 3$ , then  $\left(\frac{4\sin\theta - \cos\theta}{4\sin\theta + \cos\theta}\right)$  is equal to  
(a)  $\frac{2}{3}$  (b)  $\frac{1}{3}$  (c)  $\frac{1}{2}$  (d)  $\frac{3}{4}$



## Assertion and Reason questions

DIRECTION : In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

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

**1. Assertion:** If  $x = 2 \sin^2\theta$  and  $y = 2 \cos^2\theta + 1$  then the value of  $x + y = 3$ .

**Reason :** For any value of  $\theta$ ,  $\sin^2\theta + \cos^2\theta = 1$

**2. Assertion:**  $\sin A$  is the product of  $\sin$  and  $A$ .

**Reason :** The value of  $\sin\theta$  increases as  $\theta$  increases.

**3. Assertion:**  $(\cos^4 A - \sin^4 A)$  is equal to  $2\cos^2 A - 1$ .

**Reason :** The value of  $\cos\theta$  decreases as  $\theta$  increases.

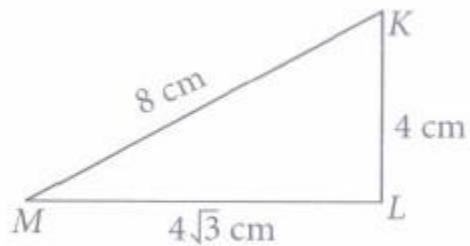
## Subjective questions

1. If  $\sin(A + B) = 1$  and  $\cos(A - B) = \frac{\sqrt{3}}{2}$ , then find  $A$  and  $B$ .
2. If  $8 \tan A = 15$ , find  $\sin A - \cos A$ .
3. Prove that  $(\sqrt{3} + 1)(3 - \cot 30^\circ) = \tan^3 60^\circ - 2 \sin 60^\circ$ .
4. In right angled triangle  $ABC$ .  $\angle C = 90^\circ$ ,  $\angle B = 60^\circ$ .  $AB = 15$  units. Find remaining angles and sides.
5. Evaluate  $\sin^2 30^\circ \cos^2 45^\circ + 4 \tan^2 30^\circ + \frac{1}{2} \sin^2 90^\circ - 2 \cos^2 90^\circ + \frac{1}{24} \cos^2 0^\circ$
6. If  $\sin \theta = \cos \theta$ , find the value of  $2 \tan^2 \theta + \sin^2 \theta - 1$
7. Find the value of  $\sin 30^\circ$ ,  $\sin 45^\circ$  and  $\sin 60^\circ$  geometrically.
8. If  $\tan(A - B) = \frac{1}{\sqrt{3}}$  and  $\tan(A + B) = \sqrt{3}$ ,  $0^\circ < A + B \leq 90^\circ$ ,  $A \geq B$ , Find  $A$  &  $B$
9. If  $x \sin^3 \theta + y \cos^3 \theta = \sin \theta \cos \theta$  and  $x \sin \theta = y \cos \theta$ , prove that  $x^2 + y^2 = 1$
10. If  $\tan \theta + \sin \theta = m$  and  $\tan \theta - \sin \theta = n$ , then prove that  $m^2 - n^2 = 4 \sqrt{mn}$
11. Prove that  $(1 + \cot A - \operatorname{cosec} A)(1 + \tan A + \sec A) = 2$
12. Prove that  $\sqrt{\frac{1 - \cos \theta}{1 + \cos \theta}} = \operatorname{cosec} \theta - \cot \theta$ .
13. Prove that:  $\sec^2 \theta - \frac{\sin^2 \theta - 2 \sin^4 \theta}{2 \cos^4 \theta - \cos^2 \theta} = 1$
14. Prove that  $\frac{\cos \theta}{\operatorname{cosec} \theta + 1} + \frac{\cos \theta}{\operatorname{cosec} \theta - 1} = 2 \tan \theta$

15. In  $\triangle OPQ$  right angled at P,  $OP = 7\text{cm}$  and  $OQ - PQ = 1\text{ cm}$ . Determine the values of  $\sin Q$  and  $\cos Q$

### Case study based questions

1. Ritu's daughter is feeling so hungry and so thought of eating something. She looked into the fridge and found some bread pieces. She decided to make a sandwich. She cut the piece of bread diagonally and found that it forms a right angled triangle with sides  $4\text{ cm}$ ,  $4\sqrt{3}\text{ cm}$  and  $8\text{ cm}$ .



On the basis of above information, answer the following questions.

- 1 Find the value of  $\angle M$  and  $\angle K$
2. Prove that  $\sec^2 M - 1 = \tan^2 M$
3. Find the value of  $\frac{\tan^2 45^\circ - 1}{\tan^2 45^\circ + 1}$

**INTERNATIONAL INDIAN SCHOOL- DAMMAM**

**CLASS X –MATHS**

**SOME APPLICATIONS OF TRIGONOMETRY**

**Multiple choice questions**

1. If the length of the shadow of a tower is increasing, then the angle of elevation of the sun  
(A) is also increasing                      (B) is decreasing  
(C) remains unaffected              (D) Don't have any relation with length of shadow
2. The angle of elevation of the top of a tower is  $30^\circ$ . If the height of the tower is doubled, then the angle of elevation of its top will  
(A) also get doubled    (B) will get halved  
(C) will be less than 60 degree                      (D) None of these
3. An observer 1.5 metres tall is 20.5 metres away from a tower 22 metres high. Determine the angle of elevation of the top of the tower from the eye of the observer.  
(A)  $30^\circ$               (B)  $45^\circ$               (C)  $60^\circ$               (D)  $90^\circ$
4. The shadow of a tower standing on a level plane is found to be 50 m longer when Sun's elevation is  $30^\circ$  than when it is  $60^\circ$ . Then the height of tower is:  
(A)  $20\sqrt{3}$               (B)  $25\sqrt{3}$               (C)  $10\sqrt{3}$               (D)  $30\sqrt{3}$
5. If a pole 6m high casts a shadow  $2\sqrt{3}$  m long on the ground, then the sun's elevation is  
(A)  $60^\circ$               (B)  $45^\circ$               (C)  $30^\circ$               (D)  $90^\circ$

**DIRECTION :** In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

(a)Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b)Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c)Assertion (A) is true but reason (R) is false.

(d)Assertion (A) is false but reason (R) is true.

6. Assertion: If the length of shadow of a vertical pole is equal to its height, then the angle of elevation of the sun is  $45^\circ$

Reason : According to Pythagoras theorem,  $h^2 = l^2 + b^2$ , where h = hypotenuse, l = length and b = base

7. Assertion (A): The ladder 20 m long makes an angle  $60^\circ$  with the wall, then the height of the point where the ladder touches the wall is 15 m.

Reason (R): For an angle  $\theta$ ,  $\cos\theta = \text{Adjacent Side} / \text{Hypotenuse}$

### Subjective questions

8. The angle of elevation of the top of a tower at a distance of 120 m from a point A on the ground is  $45^\circ$ . If the angle of elevation of the top of a flagstaff fixed at the top of the tower, at A is  $60^\circ$ , then find the height of the flagstaff [ $\sqrt{3} = 1.732$ ]
9. The angle of elevation of the top of an unfinished tower at a distance of 75m from its base is  $30^\circ$ . How much higher the tower must be raised so that the angle of elevation of its top at the same point may be  $60^\circ$ .
10. The angle of elevation of the top of a tower from a certain point is  $30^\circ$ . If the observer moves 20 metres towards the tower, the angle of elevation of the top increases by  $15^\circ$ . Find the height of the tower.
11. The angle of elevation of the top of a tower 30 m high from the foot of another tower in the same plane is  $60^\circ$  and the angle of elevation of the top of the second tower from the foot of the first tower is  $30^\circ$ . Find the distance between the two towers and also the height of the other tower.
12. A man standing on the deck of a ship, which is 10 m above the water level, observes the angle of elevation of the top of a hill as  $60^\circ$  and the angle of depression of the base of the hill as  $30^\circ$ . Calculate the distance of the hill from the ship and height of the hill.
13. A man on the top of a vertical observation tower observes a car moving at a uniform speed coming directly towards him. If it takes 12 minutes for the angle of depression to change from  $30^\circ$  to  $45^\circ$ , how soon after this, will the car reach the observation tower?
14. The angle of elevation of a jet fighter from a point A on the ground is  $60^\circ$ . After a flight of 10 seconds, the angle of elevation changes to  $30^\circ$ . If the jet is flying at a speed of 900 km/ hour, find the constant height at which the jet is flying. [Use  $\sqrt{3} = 1.732$ ]

15. The angle of elevation of the top of a tower as observed from a point on the ground is  $\alpha$  and on moving 'a' metres towards the tower, the angle of elevation is  $\beta$ . Prove that the height of the tower is  $\frac{a \tan \alpha \cdot \tan \beta}{\tan \beta - \tan \alpha}$ .

16. At a point A, 20 metre above the level of water in a lake, the angle of elevation of a cloud is  $30^\circ$ . The angle of depression of the reflection of the cloud in the lake, from A is  $60^\circ$ . Find the distance of the cloud from A ?

**Case Study Based Question**

17. A group of Class X students visited Rishikesh in Uttarakhand on a trip. They observed from a point (P) on a river bridge that the angles of depression of opposite banks of the river are  $60^\circ$  and  $30^\circ$  respectively. The height of the bridge is about 18 meters from the river.



1. Find the distance PA.
2. Find the distance PB
3. Find the width AB of the river.

**OR**

4. Find the height BQ if the angle of the elevation from P to Q be  $30^\circ$ .

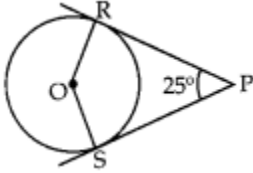


INTERNATIONAL INDIAN SCHOOL,DAMMAM

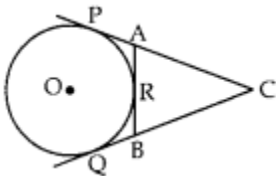
MATHEMATIS WORKSHEET 2024-2025

CIRCLES

1. In the given figure, if  $\angle RPS = 25$ , the value of  $\angle ROS$  is

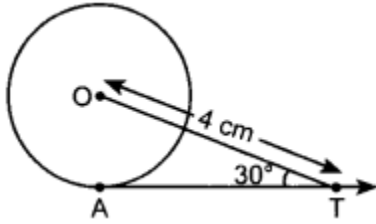


- (a)  $135^\circ$   
(b)  $145^\circ$   
(c)  $165^\circ$   
(d)  $155^\circ$
2. Number of tangents drawn at a point of the , circle is/are  
(a) one  
(b) two  
(c) none  
(d) infinite
3. The length of a tangent drawn from a point at a distance of 10 cm of circle is 8 cm. The radius of the circle is  
(a) 4 cm  
(b) 5 cm  
(c) 6 cm  
(d) 7 cm
4. In given figure, CP and CQ are tangents to a circle with centre O. ARB is another tangent touching the circle at R. If CP = 11 cm and BC = 6 cm then the length of BR is

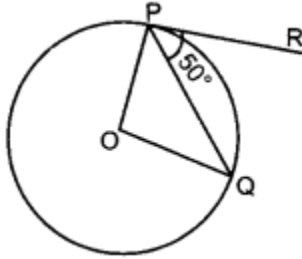


- (a) 6 cm  
(b) 5 cm  
(c) 4 cm  
(d) 3 cm
5. In figure AT is a tangent to the circle with centre O such that  $OT = 4$  cm and  $\angle OTA = 30^\circ$ . Then AT is equal to  
(a) 4 cm  
(b) 2 cm  
(c) 23 cm

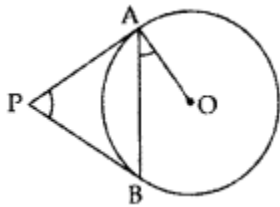
(d) 43 cm



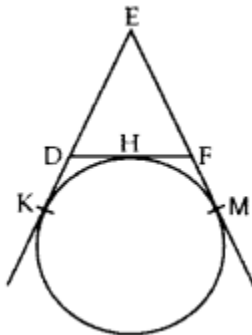
6. In figure if O is centre of a circle, PQ is a chord and the tangent PR at P makes an angle of  $50^\circ$  with PQ, then  $\hat{P}OQ$  is equal to



- (a)  $100^\circ$   
 (b)  $80^\circ$   
 (c) 90  
 (d)  $75^\circ$
7. In the given figure, PA and PB are tangents to the circle with centre O. If  $\angle APB = 60^\circ$ , then calculate  $\angle OAB$



- (a) 30  
 (b) 40  
 (c) 45  
 (d) 90
8. In the given figure, a circle touches the side DF of  $\triangle EDF$  at H and touches ED and EF produced at K & M respectively. If  $EK = 9$  cm, calculate the perimeter of  $\triangle EDF$

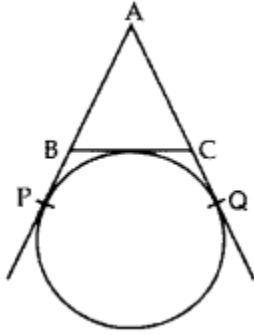


- (a) 17cm



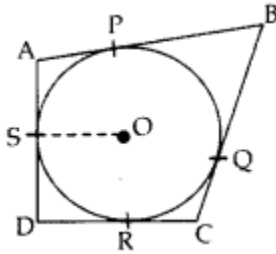
- (b) 18cm
- (c) 20cm
- (d) 21cm

9. In the given figure, AP, AQ and BC are tangents to the circle. If AB = 5 cm, AC = 6 cm and BC = 4 cm, then calculate the length of AP (in cm).



- (a) 7cm (b) 3.5cm (c) 7.5cm

10. In the given figure, a circle is inscribed in a quadrilateral ABCD touching its sides AB, BC, CD and AD at P, Q, R and S respectively. If the radius DA of the circle is 10 cm, BC = 38 cm, PB = 27 cm and  $AD \perp CD$ , then calculate the length of CD.



- (a) 21cm (b) 20cm (c) 19cm (d) 22cm

Assertion reasoning

11. **Assertion:** If length of a tangent from an external point to a circle is 8 cm, then length of the other tangent from the same point is 8 cm.

**Reason:** length of the tangents drawn from an external point to a circle are equal.

- a) If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.
- (b) If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.
- (c) If Assertion is correct but Reason is incorrect.
- (d) If Assertion is incorrect but Reason is correct.

12. **Assertion:** If in a cyclic quadrilateral, one angle is  $40^\circ$ , then the opposite angle is  $140^\circ$

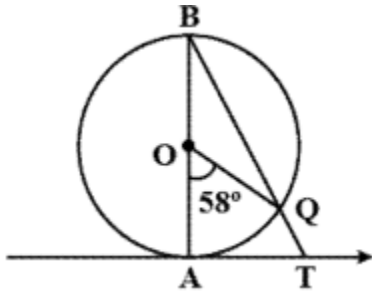
**Reason:** Sum of opposite angles in a cyclic quadrilateral is equal to  $360^\circ$

13. Prove that in two concentric circles, the chord of the larger circle, which touches the smaller circle, is bisected at the point of contact.

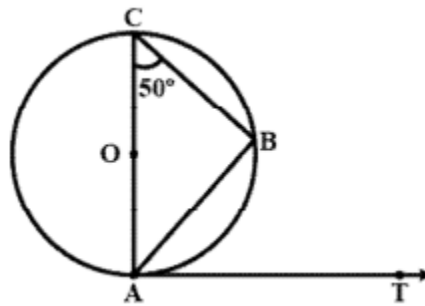
14. Prove that the tangents drawn at the ends of a diameter of a circle are parallel.

15. A quadrilateral ABCD is drawn to circumscribe a circle. Prove that  $AB + CD = AD + BC$ .

16. In given below left figure, AB is the diameter of a circle with centre O and AT is a tangent. If  $\angle AOQ = 58^\circ$ , find  $\angle ATQ$ .



17. In the above right sided figure, AB is a chord of the circle and AOC is its diameter such that  $\angle ACB = 50^\circ$ . If AT is the tangent to the circle at the point A, then find  $\angle BAT$ .

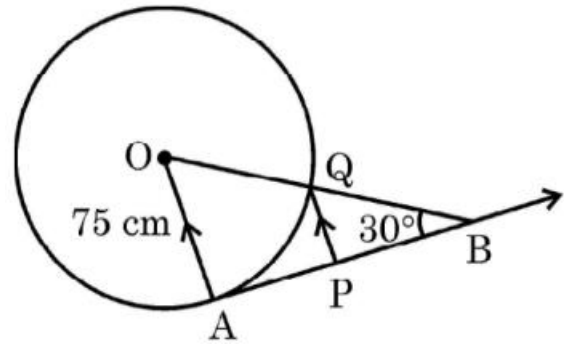
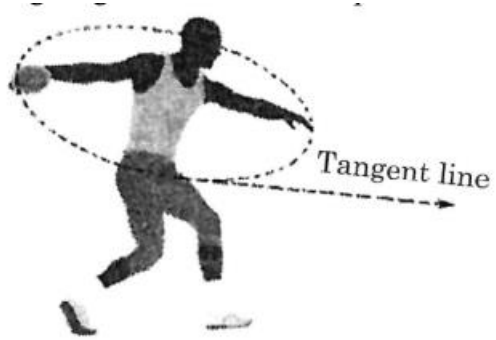


18. Prove that the lengths of the tangents drawn from an external point to a circle are equal.

19. Prove that the tangent to a circle is perpendicular to the radius through the point of contact.

20. Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Prove that  $\angle PTQ = 2 \angle OPQ$ .

21. The discus throw is an event in which an athlete attempts to throw a discus. The athlete spins anti-clockwise around one and a half times through a circle, then releases the throw. When released, the discus travels along tangent to the circular spin orbit. In the given figure, AB is one such tangent to a circle of radius 75 cm. Point O is centre of the circle and  $\angle ABO = 30^\circ$ . PQ is parallel to OA.



Based on the above, information:

- (a) Find the length of AB. (1)
- (b) Find the length of OB. (1)
- (c) Find the length of AP. (2)

OR

- (c) Find the length of PQ. (2)

**INTERNATIONAL INDIAN SCHOOL-DAMMAM**

**WORKSHEET 2024-25**

**CLASS X- MATHEMATICS**

**AREAS RELATED TO CIRCLES**

1. If the length of an arc of a circle of radius  $r$  is equal to that of an arc of a circle of radius  $2r$ , then
  - (a) the angle of the corresponding sector of the first circle is double the angle of the corresponding sector of the other circle.
  - (b) the angle of the corresponding sector of the first circle is equal the angle of the corresponding sector of the other circle.
  - (c) the angle of the corresponding sector of the first circle is half the angle of the corresponding sector of the other circle.
  - (d) the angle of the corresponding sector of the first circle is 4 times the angle of the corresponding sector of the other circle.
2. A cow is tied with a rope of length 14 m at the corner of a rectangular field of dimensions  $20\text{m} \times 16\text{m}$ , then the area of the field in which the cow can graze is:
  - (a)  $154\text{ m}^2$
  - (b)  $156\text{ m}^2$
  - (c)  $158\text{ m}^2$
  - (d)  $160\text{ m}^2$
3. Area of a sector of central angle  $120^\circ$  of a circle is  $3\pi\text{ cm}^2$ . Then the length of the corresponding arc of this sector is:
  - (a) 5.8cm
  - (b) 6.1cm
  - (c) 6.3cm
  - (d) 6.8cm
4. The hour hand of a clock is 6 cm long. The area swept by it between 11.20 am and 11.55 am is
  - (a)  $2.75\text{ cm}^2$
  - (b)  $5.5\text{ cm}^2$
  - (c)  $11\text{ cm}^2$
  - (d)  $10\text{ cm}^2$

**Directions:** In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

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

5. **Assertion (A):** In a circle of radius 6 cm, the angle of a sector is  $60^\circ$ . Then the area of the sector is  $132/7 \text{ cm}^2$ .

**Reason (R):** Area of the circle with radius  $r$  is  $\pi r^2$ .

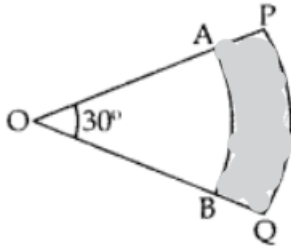
6. **Assertion (A):** The length of the minute hand of a clock is 7 cm. Then the area swept by the minute hand in 5 minutes is  $77/6 \text{ cm}^2$ .

**Reason (R):** The length of an arc of a sector of angle  $\theta$  and radius  $r$  is given by

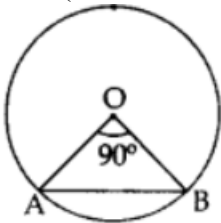
$$l = \frac{\theta}{360^\circ} \times 2\pi r$$

### Subjective Questions

7. The circumference of a circle is 22 cm. Calculate the area of its quadrant (in  $\text{cm}^2$ )
8. The length of the minute hand of a clock is 14 cm. Find the area swept by the minute hand in 20 minutes.
9. In the Figure, PQ and AB are respectively the arcs of two concentric circles of a radii 7 cm and 3.5 cm and centre O. If  $\angle POQ = 30^\circ$ , then find the area of the shaded region.



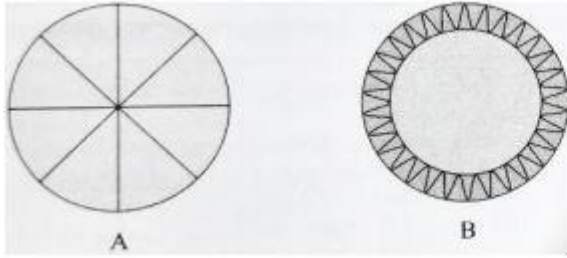
10. Find the area of the major segment, in the figure of a circle of radius 35 cm and  $\angle AOB = 90^\circ$ . (Use  $\pi = 22/7$ )



11. A chord of a circle of radius 14 cm subtends an angle of  $120^\circ$  at the centre. Find the area of the corresponding minor segment of the circle. (Use  $\pi = 22/7$  and  $\sqrt{3} = 1.73$ )

### Case study questions

12. A brooch is a small piece of jewellery which has a pin at the back so it can be fastened on a dress, blouse or coat. Designs of some brooch are shown below. Observe them carefully.



Design A: Brooch A is made with silver wire in the form of a circle with diameter 28mm. The wire used for making 4 diameters which divide the circle into 8 equal parts.

Design B: Brooch b is made two colours - Gold and silver. Outer part is made with Gold. The circumference of silver part is 44mm and the gold part is 3mm wide everywhere.

1. Find the total length of silver wire required in design A
2. Find the area of each sector of the brooch in design A
3. Find the difference in areas of golden and silver parts in design B

**INTERNATIONAL INDIAN SCHOOL-DAMMAM**

**WORKSHEET 2024-25**

**CLASS X- MATHEMATICS**

**SURFACE AREAS AND VOLUMES**

- Two cubes each of volume  $8\text{ cm}^3$  are joined end to end, then the surface area of the resulting cuboid is  
(a)  $80\text{ cm}^2$  (b)  $64\text{ cm}^2$  (c)  $40\text{ cm}^2$  (d)  $8\text{ cm}^2$
- The surface area of the two spheres are in the ratio 1 : 2. The ratio of their volumes is :  
(a)  $\sqrt{2}:1$  (b)  $1:2\sqrt{}$  (c)  $1:8$  (d)  $1:4$
- If two solid hemispheres of same base radii  $r$ , are joined together along their bases, then curved surface area of this new solid is  
(a)  $4\pi r^2$  (b)  $6\pi r^2$  (c)  $3\pi r^2$  (d)  $8\pi r^2$
- A solid cylinder of radius  $r$  and height  $h$  is placed over other cylinder of same height and radius. The total surface area of the shape so formed is  
(a)  $4\pi rh + 4\pi r^2$  (b)  $4\pi rh - 4\pi r^2$  (c)  $4\pi rh + 2\pi r^2$  (d)  $4\pi rh - 2\pi r^2$
- A medicine-capsule is in the shape of a cylinder of diameter 0.5 cm with two hemispheres stuck to each of its ends. The length of entire capsule is 2 cm. The capacity of the capsule is  
(a)  $0.36\text{ cm}^3$  (b)  $0.35\text{ cm}^3$  (c)  $0.34\text{ cm}^3$  (d)  $0.33\text{ cm}^3$

**Direction:** In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as:

- (a) Both Assertion (A) & Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).  
(b) Both Assertion (A) & Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).  
(c) Assertion (A) is true but Reason (R) is false.  
(d) Assertion (A) is false but Reason (R) is true.
- Assertion:** No. of spherical balls that can be made out of a solid cube of lead whose edge is 44 cm, each ball being 4 cm. in diameter, is 2541

**Reason:** Number of balls = Volume of one ball / Volume of lead

7. **Assertion:** A cylinder and right circular cone are having the same base and same height. Then the volume of cylinder is three times the volume of cone.

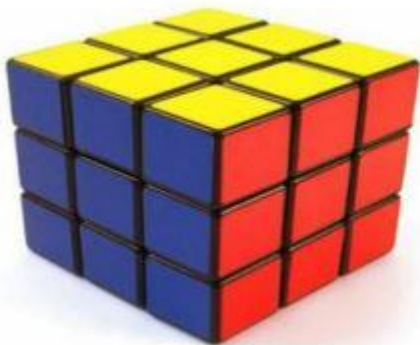
**Reason:** If the radius of a cylinder is doubled and height is halved the volume will be doubled.

### Subjective questions

8. Volume and surface area of a solid hemisphere are numerically equal. What is the diameter of hemisphere?
9. A toy is in the form of a cone mounted on a hemi-sphere of same radius. The diameter of the base of the conical part is 7cm and the total height of the toy is 14.5cm. find the volume of the toy.
10. A bird-bath in a garden is in the shape of a cylinder with a hemi-spherical depression at one end. The height of the hollow cylinder is 1.45m and its radius is 30cm. find the inner surface area of the bird-bath.
11. A metallic cylinder has radius 3cm and height 5cm. To reduce its weight, a conical hole is drilled in the cylinder.. The conical hole has a radius of  $\frac{3}{2}$  cm. and its depth is  $\frac{8}{9}$ cm. Calculate the ratio of the volume of metal left in the cylinder to the volume of metal taken out in the conical shape.
12. A tent is in the shape of a right circular cylinder up to a height of 300 cm and conical above it. The total height of the tent is 1350 cm and radius of its base is 1400cm. Find the cost of cloth required to make the tent at the rate of Rs.80 per square metre.

### Case study question

1. On a Sunday, your parents took you to a fair. You could see lot of toys displayed, and you wanted them to buy a RUBIK's cube and strawberry ice-cream for you. Observe the figures and answer the questions:-



1. Find the length of the diagonal of the cube if each edge measures 6cm
2. What is the curved surface area of hemisphere (ice cream) if the base radius is 7cm?
3. Find the total surface area of the cone with hemispherical ice cream .



**INTERNATIONAL INDIAN SCHOOL DAMMAM**

**MATHEMATICS WORKSHEET GRADE-X (2024-25)**

**STATISTICS**

1.	For a frequency distribution, mean, median and mode are connected by the relation (a) $\text{mode} = 3\text{mean} - 2\text{median}$ (b) $\text{mode} = 2\text{median} - 3\text{mean}$ (c) $\text{mode} = 3\text{median} - 2\text{mean}$ (d) $\text{mode} = 3\text{median} + 2\text{mean}$														
2.	The class mark of a class interval is (a) upper limit + lower limit    (b) upper limit - lower limit (c) $\frac{1}{2}$ (upper limit + lower limit)    (d) $\frac{1}{2}$ (upper limit - lower limit)														
3.	For the following distribution <table border="1" style="margin-left: auto; margin-right: auto;"><thead><tr><th>Marks</th><th>Number of students</th></tr></thead><tbody><tr><td>Below 10</td><td>3</td></tr><tr><td>Below 20</td><td>12</td></tr><tr><td>Below 30</td><td>27</td></tr><tr><td>Below 40</td><td>57</td></tr><tr><td>Below 50</td><td>75</td></tr><tr><td>Below 60</td><td>80</td></tr></tbody></table> <p>the modal class is (a) 10 - 20    (b) 20 - 30    (c) 30 - 40    (d) 40 - 50</p>	Marks	Number of students	Below 10	3	Below 20	12	Below 30	27	Below 40	57	Below 50	75	Below 60	80
Marks	Number of students														
Below 10	3														
Below 20	12														
Below 30	27														
Below 40	57														
Below 50	75														
Below 60	80														
4.	In a grouped frequency distribution, the mid values of the classes are used to measure which the following central tendency? (a) mode (b) median    (c) mean    (d) all the above three measures														
5.	The median class of the following distribution is <table border="1" style="margin-left: auto; margin-right: auto;"><thead><tr><th>C.I</th><th>0 - 10</th><th>10 - 20</th><th>20 - 30</th><th>30 - 40</th><th>40 - 50</th><th>50 - 60</th></tr></thead><tbody><tr><td>F</td><td>8</td><td>10</td><td>12</td><td>22</td><td>30</td><td>18</td></tr></tbody></table> (a) 10 - 20    (b) 20 - 30    (c) 30 - 40    (d) 40 - 50	C.I	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	F	8	10	12	22	30	18
C.I	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60									
F	8	10	12	22	30	18									
6.	In a continuous frequency distribution with usual notations, if $l = 32.5$ , $f_1 = 15$ , $f_0 = 12$ , $f_2 = 8$ and $h = 8$ , then the mode of the data is (a) 32.5    (b) 33.5    (c) 33.9    (d) 34.9														
7.	In a frequency distribution, the class width is 4 and the lower limit of first class is 10. If there are six classes, the upper limit of last class is (a) 22    (b) 26    (c) 30    (d) 34														
8.	In the formula $\bar{x} = a + \frac{\sum f_i d_i}{\sum f_i}$ , finding the mean of the grouped data, $d_i$ 's are deviations from assumed mean 'a' of (a) lower limits of classes    (b) upper limits of classes (c) class marks    (d) frequencies of the classes.														
9.	If the value of Mode and Mean is 60 and 66 respectively, find Median.														

10.	<p>The following table shows the cumulative frequency distribution of marks of 800 students in an examination:</p> <table border="1" data-bbox="186 178 1502 315"> <tr> <th>Marks</th> <th>Below 10</th> <th>Below 20</th> <th>Below 30</th> <th>Below 40</th> <th>Below 50</th> <th>Below 60</th> <th>Below 70</th> <th>Below 80</th> <th>Below 90</th> <th>Below 100</th> </tr> <tr> <td>No. of Students</td> <td>8</td> <td>17</td> <td>32</td> <td>62</td> <td>80</td> <td>80</td> <td>80</td> <td>80</td> <td>80</td> <td>80</td> </tr> </table> <p>Find the mean marks.</p>	Marks	Below 10	Below 20	Below 30	Below 40	Below 50	Below 60	Below 70	Below 80	Below 90	Below 100	No. of Students	8	17	32	62	80	80	80	80	80	80
Marks	Below 10	Below 20	Below 30	Below 40	Below 50	Below 60	Below 70	Below 80	Below 90	Below 100													
No. of Students	8	17	32	62	80	80	80	80	80	80													
11.	<p>The percentage of marks obtained by 100 students in an examination are given below:</p> <table border="1" data-bbox="235 430 1461 525"> <tr> <th>Marks</th> <th>30-35</th> <th>35-40</th> <th>40-45</th> <th>45-50</th> <th>50-55</th> <th>55-60</th> <th>60-65</th> </tr> <tr> <td>No. of Students</td> <td>14</td> <td>16</td> <td>18</td> <td>23</td> <td>18</td> <td>8</td> <td>3</td> </tr> </table> <p>Determine the median percentage of marks.</p>	Marks	30-35	35-40	40-45	45-50	50-55	55-60	60-65	No. of Students	14	16	18	23	18	8	3						
Marks	30-35	35-40	40-45	45-50	50-55	55-60	60-65																
No. of Students	14	16	18	23	18	8	3																
12.	<p>Find the mean, mode and median marks for the following frequency distribution.</p> <table border="1" data-bbox="284 630 1453 777"> <tr> <th>Marks</th> <th>Less than 10</th> <th>Less than 20</th> <th>Less than 30</th> <th>Less than 40</th> <th>Less than 50</th> <th>Less than 60</th> </tr> <tr> <td>No. of Students</td> <td>2</td> <td>3</td> <td>6</td> <td>7</td> <td>14</td> <td>20</td> </tr> </table>	Marks	Less than 10	Less than 20	Less than 30	Less than 40	Less than 50	Less than 60	No. of Students	2	3	6	7	14	20								
Marks	Less than 10	Less than 20	Less than 30	Less than 40	Less than 50	Less than 60																	
No. of Students	2	3	6	7	14	20																	
13.	<p>Find the missing frequencies <math>f_1</math> and <math>f_2</math> in table given below; it is being given that the mean of the given frequency distribution is 50.</p> <table border="1" data-bbox="300 892 1388 987"> <tr> <th>Class</th> <th>0-20</th> <th>20-40</th> <th>40-60</th> <th>60-80</th> <th>80-100</th> <th>Total</th> </tr> <tr> <td>Frequency</td> <td>17</td> <td><math>f_1</math></td> <td>32</td> <td><math>f_2</math></td> <td>19</td> <td>120</td> </tr> </table>	Class	0-20	20-40	40-60	60-80	80-100	Total	Frequency	17	$f_1$	32	$f_2$	19	120								
Class	0-20	20-40	40-60	60-80	80-100	Total																	
Frequency	17	$f_1$	32	$f_2$	19	120																	
14.	<p>Find the missing frequencies in the following frequency distribution table, if the total frequency is 100 and median is 32.</p> <table border="1" data-bbox="365 1092 1323 1186"> <tr> <th>Marks</th> <th>0-10</th> <th>10-20</th> <th>20-30</th> <th>30-40</th> <th>40-50</th> <th>50-60</th> </tr> <tr> <td>No. of Students</td> <td>10</td> <td><math>x</math></td> <td>25</td> <td>30</td> <td><math>y</math></td> <td>10</td> </tr> </table>	Marks	0-10	10-20	20-30	30-40	40-50	50-60	No. of Students	10	$x$	25	30	$y$	10								
Marks	0-10	10-20	20-30	30-40	40-50	50-60																	
No. of Students	10	$x$	25	30	$y$	10																	
15.	<p>The mode of the following data is 36. Find the values of <math>x</math>.</p> <table border="1" data-bbox="341 1260 1461 1365"> <tr> <th>Class</th> <th>0-10</th> <th>10-20</th> <th>20-30</th> <th>30-40</th> <th>40-50</th> <th>50-60</th> <th>60-70</th> </tr> <tr> <td>Frequency</td> <td>8</td> <td>10</td> <td><math>x</math></td> <td>16</td> <td>12</td> <td>6</td> <td>7</td> </tr> </table>	Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70	Frequency	8	10	$x$	16	12	6	7						
Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70																
Frequency	8	10	$x$	16	12	6	7																
16.	<p><b>Assertion:</b> The arithmetic mean of the following given frequency distribution table is 13.81.</p> <table border="1" data-bbox="503 1512 1266 1596"> <tr> <td><math>x</math></td> <td>4</td> <td>7</td> <td>10</td> <td>13</td> <td>16</td> <td>19</td> </tr> <tr> <td><math>f</math></td> <td>7</td> <td>10</td> <td>15</td> <td>20</td> <td>25</td> <td>30</td> </tr> </table> <p><b>Reason:</b> <math>\bar{X} = \frac{\sum f_i X_i}{\sum f_i}</math></p> <p>(a) Both assertion and Reason are correct and reason is the correct explanation for assertion.          (b) Both assertion and Reason are correct and reason is not the correct explanation for assertion.          (c) Assertion is correct but reason is wrong.          (d) Assertion is incorrect but reason is correct.</p>	$x$	4	7	10	13	16	19	$f$	7	10	15	20	25	30								
$x$	4	7	10	13	16	19																	
$f$	7	10	15	20	25	30																	

17. Calculate the median marks of the given distribution.

Marks	No. Of Students
More than 65	24
More than 60	54
More than 55	74
More than 50	90
More than 45	96
More than or equal to 40	100

18.

Height (in cm)	Number of girls
Less than 140	4
Less than 145	11
Less than 150	29
Less than 155	40
Less than 160	46
Less than 165	51

Calculate the Median of the distribution.

19. Household income in India was drastically impacted due to COVID-19 lockdown. Most of the companies decided to bring down the salaries of the employees by 50%. The following table shows the salaries ( in percent) received by 25 employees in a company.



Salaries Received (in percent)	50-60	60-70	70-80	80-90
Number of employees	9	6	8	2

1. Find the median class of the given data.
2. What is the lower limit of the modal class?
3. If  $x_i$ 's denote the class marks and  $f_i$ 's denote the corresponding frequencies for the given data, then find  $\Sigma f_i x_i$

20. An inspector in enforcement squad of electricity department visit a locality of 100 families and record their monthly consumption of electricity and various factors affecting the consumption and summarized the data as follows:



Monthly Consumption	Number of families
0-100	2
100-200	5
200-300	X
300-400	12
400-500	17
500-600	20
600-700	Y
700-800	9
800-900	7
900-1000	4

Based on the above information, answer the following:

- (i) Find  $x+y$
- (ii) Find the lower limit of the class preceding the modal class.
- (iii) If the median of the above data is 525, the find the value of  $x$ .

**INTERNATIONAL INDIAN SCHOOL, DAMMAM**

**CLASS X - MATHEMATICS WORKSHEET:**

**2024-25 CHAPTER -15      PROBABILITY**

**MULTIPLE CHOICE QUESTIONS**

- Three coins are tossed simultaneously. The probability of getting all heads is  
(a) 1      (b)  $\frac{1}{2}$       (c)  $\frac{1}{4}$       (d)  $\frac{1}{8}$
- One card is drawn from a well shuffled deck of 52 playing cards. The probability of getting a non-face card is  
(a)  $\frac{3}{13}$       (b)  $\frac{10}{13}$       (c)  $\frac{7}{13}$       (d)  $\frac{4}{13}$
- A lot consists of 144 ball pens of which 20 are defective and the others are good. Tanu will buy a pen if it is good but will not buy if it is defective. The shopkeeper draws one pen at random and gives it to her. The probability that she will buy that pen is  
(a)  $\frac{5}{36}$       (b)  $\frac{20}{36}$       (c)  $\frac{31}{36}$       (d)  $\frac{31}{144}$
- What is the probability of getting 53 Mondays in a leap year?  
(a)  $\frac{1}{7}$       (b)  $\frac{53}{366}$       (c)  $\frac{2}{7}$       (d)  $\frac{7}{366}$
- If 3 coins are tossed simultaneously, what is the probability of getting at most one tail?  
(a)  $\frac{3}{8}$       (b)  $\frac{1}{2}$       (c)  $\frac{5}{8}$       (d)  $\frac{7}{8}$
- In a lottery there are 5 prizes and 20 blanks. The probability of getting a prize is  

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(a)  $\frac{1}{4}$       (b)  $\frac{1}{20}$       (c)  $\frac{1}{25}$       (d)  $\frac{1}{5}$
- A bag contains 100 cards numbered 1 to 100. A card is drawn at random from the bag. What is the probability that the number on the card is a perfect cube?  
(a)  $\frac{1}{20}$       (b)  $\frac{3}{50}$       (c)  $\frac{1}{25}$       (d)  $\frac{7}{100}$
- Which of the following cannot be the probability of an event?  
(a) 1.5      (b)  $\frac{3}{5}$       (c) 25%      (d) 0.3
- A bag contains three green marbles, four blue marbles & two orange marbles. One marble is picked at random, then the probability that it is not an orange marble is  
(a)  $\frac{1}{4}$       (b)  $\frac{1}{3}$       (c)  $\frac{4}{9}$       (d)  $\frac{7}{9}$
- Two dice are thrown simultaneously. The probability of getting a sum of 9 is:  
(a)  $\frac{1}{10}$       (b)  $\frac{3}{10}$       (c)  $\frac{1}{9}$       (d)  $\frac{4}{9}$

### SUBJECTIVE QUESTIONS

11. The king, queen and jack of clubs are removed from a deck of 52 playing cards. The remaining cards are mixed together and then a card is drawn at random from it. Find the probability of getting  
(i) a face card (ii) a card of heart (iii) a card of clubs (iv) a queen of diamond
12. Two different dice are thrown together. Find the probability that the numbers obtained  
(i) have a sum less than 7 (ii) have a product less than 16 (iii) is a doublet of odd number.
13. An integer is chosen at random between 1 and 100. Find the probability that it is  
(i) divisible by 8 (ii) not divisible by 8
14. Two different dice are tossed together. Find the probability:  
(i) of getting a doublet (ii) of getting a sum 10, of the numbers on the two dice.
15. If three different coins are tossed together, then find the probability of getting atleast two heads

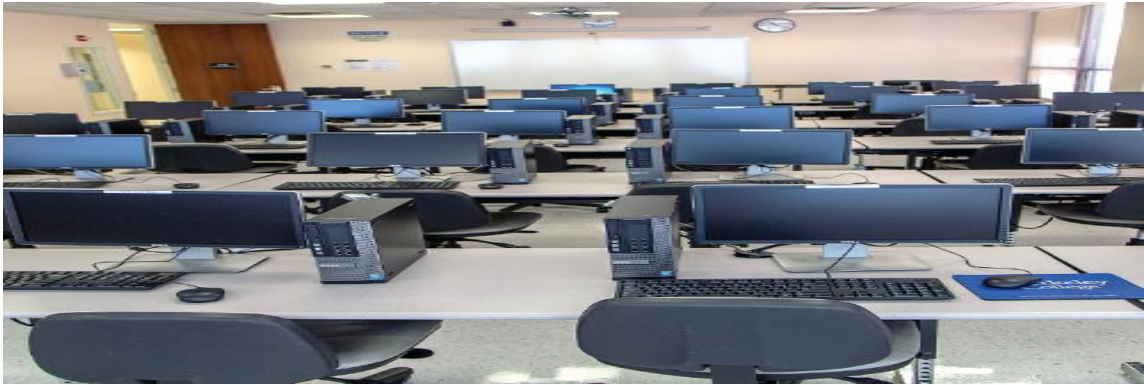
### ASSERTION AND REASONING

**Direction:** In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option.

- (a) Both Assertion (A) & Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).
  - (b) Both Assertion (A) & Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
  - (c) Assertion (A) is true but Reason (R) is false.
  - (d) Assertion (A) is false but Reason (R) is true.
16. **Assertion (A):** If a pair of dice is thrown once, then the probability of getting a sum of 8 is  $\frac{5}{36}$ .  
**Reason (R):** In a simultaneous toss of two coins, the probability of getting exactly one head is  $\frac{1}{2}$ .
17. **Assertion:** If a die is thrown, the probability of getting a number less than 3 & greater than 2 is zero.  
**Reason:** Probability of an impossible event is zero
18. **Assertion:** If a box contains 5 white, 2 red and 4 black marbles, then the probability of not drawing a white marble from the box is  $\frac{5}{11}$ .  
**Reason:**  $P(\bar{E}) = 1 - P(E)$ , where E is any event.

### CASE STUDY QUESTIONS:

19. Computer-based learning (CBL) refers to any teaching methodology that makes use of computers for information transmission. At an elementary school level, computer applications can be used to display multimedia lesson plans. A survey was done on 1000 elementary and secondary schools of Assam and they were classified by the number of computers they had.



Number of computers	1 – 10	11 - 20	21 - 50	51 - 100	101 - more
Number of schools	250	200	290	180	80

One school is chosen at random. Then:

(i) Find the probability that the school chosen at random has more than 100 computers.

(ii)

a) Find the probability that the school chosen at random has 50 or fewer computers.

OR

(b) Find the probability that the school chosen at random has no more than 20 computers.

(iii) Find the probability that the school chosen at random has 10 or less than 10 computers.

20. Rahul goes to a fete in Mussoorie. There he saw a game having prizes-wall clocks, power banks and water bottles. The game consists of a box having cards inside it, bearing the numbers 1 to 200, one on each card. A person has to select a card at random. Now, the winning of prizes has the following conditions:
- Wall clock - If the number on the selected card is a perfect square.
- Power bank-If the number on the selected card is multiple of 3.
- Water bottle-If the number on the selected card is a prime number more than 100 but less than 150.
- Better luck next time - If the number on the selected card is a perfect cube.
- Find the probability of winning a wall clock.
  - Find the probability of getting better luck next time.
  - Find the probability of winning a power bank.

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