Brain International School
Vikas Puri, New Delhi

REVISION SHEET

SUBJECT: MATHEMATICS **CLASS- X** **TERM 1**

REAL NUMBERS

Q1. Find the HCF of 96 and 404 by the prime factorization method. Hence, find their LCM.

Q2. Prove that $2-\sqrt{3}$ is irrational, given that $\sqrt{3}$ is irrational.

Q3. Two tankers contain 620 litres and 840 litres of diesel respectively. Find the maximum capacity of a container which can measure the diesel of both the tankers in exact number of times.

Q4.A person wanted to distribute 96 apples and 112 oranges among poor children in an orphanage He packed all the fruits in boxes in such a way that each box contains fruits of the same variety, and also every box contains an equal number of fruits.Find the minimum number of boxes in all the fruits can be packed.

Q5.Three numbers are in the ratio 3:4:5 and their LCM is 2400. Find their H.C.F.

Q6.Assertion(A): The number 6^n, n being a natural number, ends with the digit 5.

Reason(R): The number 9^n cannnot end with digit 0 for any natural number n.

(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 reasons (R) is false.

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

Q7.If two positive integers p and q can be expressed as $p = ab^2$ and $q = a^3b$, where a, b being prime numbers, then LCM (p, q) is equal to:
(a) ab (b) a^2b^2 (c) a^3b^2 (d) a^3b^3

POLYNOMIALS

Q1.Find a quadratic polynomial if the sum and product of its zeroes are $\sqrt{2}$ and $\frac{-3}{2}$ respectively. Also find its zeroes.

Q2.If the sum of the zeroes of a given polynomial $f(x) = ax^2 + 2x + 3a$ is equal to their product, find the value of a.

Q3. Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes, respectively.

(i) 1/4, -1   (ii) 1, 1

Q4. Find a quadratic polynomial whose zeroes are $5 + \sqrt{2}$ and $5 - \sqrt{2}$

Q5. Find a quadratic polynomial, the sum of whose zeroes is 0 and one zero is 5.

Q6. Find the zeroes of $4x^2 - 7$ and verify the relationship between the zeroes and its coefficients.

Q7. If one zero of the polynomial $(k + 1)x^2 - 5x + 5$ is multiplicative inverse of the other, then find the zeroes of $kx^2 - 3kx + 9$, where k is a constant.

Q8. What is the product of zeroes of the polynomial $2x^2 - 7x + 6$?
(a) 12   (b) 9   (c) 3   (d) -7

A PAIR OF LINEAR EQUATIONS IN TWO VARIABLES

Q1. The pair of equation $x = -4$ and $y = -5$ graphically represents lines which are
(a) intersecting at $(-5, -4)$ (b) intersecting at $(-4, -5)$
(c) intersecting at $(5, 4)$ (d) intersecting at $(4, 5)$

Q2. Asha has only ₹1 and ₹2 coins with her. If the total number of coins that she has is 50 and the amount of money with her is ₹75, then the number of ₹1 and ₹2 coins are, respectively
(a) 35 and 15   (b) 15 and 35   (c) 35 and 20   (d) 25 and 25

Q3. The father's age is six times his son's age. Four years hence, the age of the father will be four times his son's age. The present ages of the son and the father are, respectively
(a) 4 and 24   (b) 5 and 30   (c) 6 and 36   (d) 3 and 24

Q4. The sum of the digits of a two-digit number is 9. If 27 is added to it, the digits of the number get reversed. The number is
(a) 27   (b) 72   (c) 45   (d) 36

Q5. The ratio of incomes of 2 persons is 9:7 and the ratio of their expenditures is 4:3. If each of them saves rupees 2000 per month, find their monthly incomes.

Q6. For what value(s) of k, is the system of equations $kx + 2y = 3$ and $2x + y = 5$ inconsistent?

  (a) K = any real number   (b) $k \neq 2$ (c) $k \neq 4$ (d) $k = 4$

Q7. 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.

Q8. Solve $2x + 3y = 11$ and $2x - 4y = -24$ and hence find the value of 'm' for which $y = mx + 3$.

Q9. A father's age is three times the sum of the ages of his 2 children. After 5 years, his age will be two times the sum of their children ages. Find the present age of the father.

Q10. x and y are complementary angles such that $x:y = 1:2$. Express the given information as a system of linear equations in two variables and hence solve it.

QUADRATIC EQUATIONS

1. If one of the root of the quadratic equations $x^2 + 7x + 12$ is -4 , then the other root is given :

  (a) -3   (b)-5   (c) -6   (d) +3

2. 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

3. The value of k for which the quadratic equation $2x^2 - kx + k = 0$ has equal roots.

(a) only 0   (b) only 8   (c) 0 and 8   (d) can't find

4. If $x = \frac{1}{\sqrt{3}}$ is a root of the equation $P x^2 + (\sqrt{3} - \sqrt{2})x - 1 = 0$, then the value of $P^2 + 1$ is :

(a) $\sqrt{6}$ (b) 6   (c) 7   (d) 8

5.
If $x = \sqrt{x}$, $(x \neq 0)$ is expressed as a quadratic equation in the form $ax^2 + bx + c = 0$, then the value of $a + b + c$ is :

(A) 0   (B) 1

(C) 2   (D) 3

6.

Assertion (A) : Every quadratic equation has two real roots.

Reason (R) : A quadratic polynomial can have at most two zeroes.

7. Find two consecutive odd positive integers, sum of whose square is 290.

ARITHMETIC PROGRESSION

1.What is the common difference of following AP:

$3, \ 3 + \sqrt{2}, \ 3 + 2\sqrt{2}, \ 3 + 3\sqrt{2}, \ \cdots$

2.If $T_n = 2n - 3$ then what is the common difference of A.P ?

3.In the month of April to June 2022, the exports of passenger cars from India increased by 26% in the corresponding quarter of 2021–22, as per a report. A car manufacturing company planned to produce 1800 cars in 4th year and 2600 cars in 8th year. Assuming that the production increases uniformly by a fixed number every year.

 Based on the above information answer the following questions.

(i) Find the production in the 1st year.
(ii) Find the production in the 12th year.
(iii) Find the total production in first 10 years.
(iv) In how many years will the total production reach 31200 cars.
4.

In a society, a yoga instructor was hired to train the people of the socie
to live a healthy lifestyle. Yoga sessions were held daily from 5 p.m.
7 p.m. in the society park. On day one, 5 people joined the yoga sessic
on day two, 3 more people joined, on day three, another 3 people join
and in this manner every next day, 3 more people kept on joining.

Based on the given information, answer the following questions :

(i) On which day did 59 people join the yoga session ?   1

(ii) How many people joined the yoga session on the 31st day ?   1

(iii) (a) The yoga instructor was paid ₹ 100 for each person
attending the yoga session. On which day would he earn
₹ 5,000 ?   2

OR

(b) What was the total amount earned by the yoga instructor in
16 days ?   2

5.

In a garden, saplings of rose flowers were planted at equal intervals to
form a spiral pattern. The spiral is made up of successive semicircles,
with centres alternatively at A and B, starting with centre at A, of radii
50 cm, 100 cm, 150 cm, ... as shown in the figure given below. Spiral 1
has 10 flowers, Spiral 2 has 20 flowers, Spiral 3 has 30 flowers and so on.
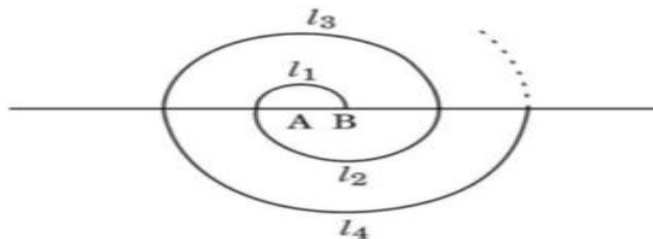
(i) What is the radius of the 13th spiral ?   1

(ii) If the radius of the nth spiral is 500 cm, find the value of n.   1

(iii) (a) Find the total number of saplings till the 11th spiral.   2

OR

(b) Till which spiral, will there be a total of 450 saplings ?   2

6. Find the A.P whose third term is 16 and seventh term exceeds the fifth term by 12. Also find the sum of first 29 terms of the A.P

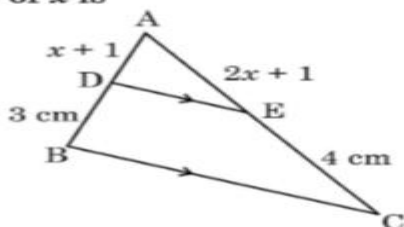7. Find the sum of first 20 terms of an A.P whose nth term is given by $a_n = 5 + 2n$. Can 52 be a term of this A.P?

TRIANGLES

Q1. In Figure, PQ is parallel to MN. If $\frac{KP}{PM} = \frac{4}{13}$ and KN = 20.4 cm. Find KQ.
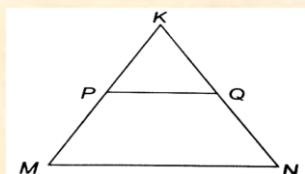
2.

In $\triangle ABC$, DE||BC. If AE = (2x + 1) cm, EC = 4 cm, AD = (x + 1) cm and DB = 3 cm, then value of x is

(A) 1   (B) $\frac{1}{2}$

(C) -1 (D) $\frac{1}{3}$

3.

Assertion (A) : $\triangle ABC \sim \triangle PQR$ such that $\angle A = 65°$, $\angle C = 60°$. Hence $\angle Q = 55°$.

Reason (R) : Sum of all angles of a triangle is 180°.

4.

The perimeters of two similar triangles are 22 cm and 33 cm respectively. If one side of first triangle is 9 cm, then find the length of corresponding side of the second triangle.
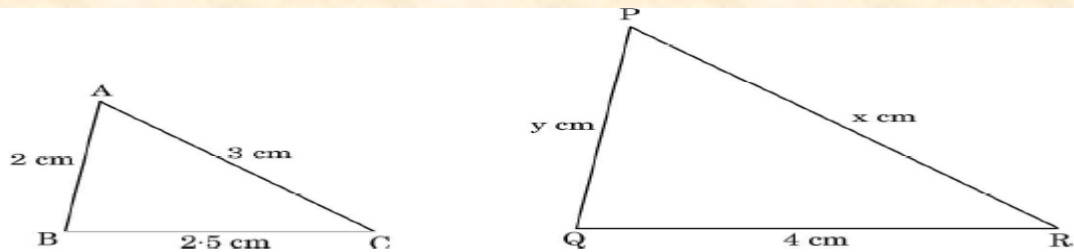
5.

Which types of triangles are always similar ?
(A)   Right-angled triangles
(B)   Acute-angled triangles
(C)   Isosceles triangles
(D)   Equilateral triangles

6.

What values of x and y will make Δ ABC similar to Δ QRP in the figures given below?

(A)   x = 6, y = 5
(B)   x = 5, y = 6
(C)   x = 6, y = 6
(D)   x = 12, y = 3·2

COORDINATE GEOMETRY

1. The distance of a point from the x-axis is called :

 (a) ordinate   (b) abscissa   (c) coordinate   (d) none of these

2. **Assertion(A)**: The point (–1, 6) divides the line segment joining the points (–3, 10) and (6, –8) in the ratio 2: 7 internally.

Reason(R): Given three points, i.e. A, B, C form an equilateral triangle, then AB = BC = AC

3.

There is a semicircular park in Aman's society. He wishes to plant saplings along the boundary of the park. There is a borewell at the centre O of the park along the diameter AB as shown in the figure below.
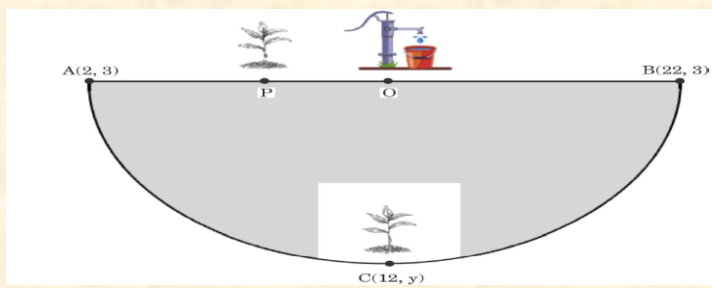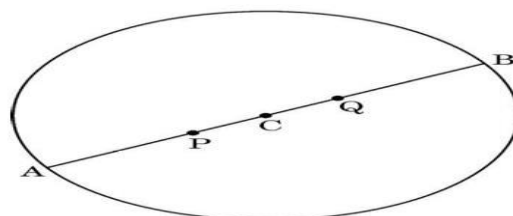

Based on the above information, answer the following questions :

(i)   Find the coordinates of point O.   1
(ii)   Find the radius of the semicircular park.   1
(iii)   (a)   One sapling is kept at point C(12, y). Find the coordinates
                    of C.   2

                              OR

          (b)   One sapling is kept at point P along AB so that PA = $\frac{1}{3}$ PB.
                    Find the coordinates of P.   2

4.

In a society, there is a circular park having two gates. The gates are placed at points A(10, 20) and B(50, 50), as shown in the figure below. Two fountains are installed at points P and Q on AB such that AP = PQ = QB.

Based on the above information, answer the following questions :

(i) Find the coordinates of the centre C.   1

(ii) Find the radius of the circular park.   1

(iii) (a) Find the coordinates of the point P.   2

OR

(b) Find the distance of the fountain at Q from gate A.   2

INTRODUCTION TO TRIGONOMETRY

Q1. Find the value of $\dfrac{5\,Sin^2 30° + Cos^2 45° - 4\,Tan^2 30°}{2\,Sin\,30°\,Cos\,30° + Tan\,45°}$

Q2. In Δ ABC, right angled at C, if TanA =1, then 2SinACosA is;

(a) 1   (b) 2   (c) $\dfrac{\sqrt{3}}{2}$ (d) $\dfrac{1}{2}$

Q3. If sin(A + B) = 1 and cos(A − B) = √3/2, 0°< A + B ≤ 90° and A > B, then find the measures of angles A and B.

Q4. In triangle ABC, right-angled at B, if $\tan A = \dfrac{1}{\sqrt{3}}$, find the value of:

   Sin A Cos C + Cos A Sin C.

Q5. 4 Tan²A − 4 Sec²A is equal to

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

Q6. If sinθ + cosθ = √2 cosθ, (θ ≠ 90°) then the value of tanθ is:

(a)√2-1   (b)√2+1   (c)√2   (d)-√2

Q7. In a ΔABC, If tan A = cot B, then A + B is equal to :

(a) 60°   (b) 120°   (c) 90°   (d) 75°.

Q8. If sin A = $\frac{3}{5}$ then cosA is equal to :

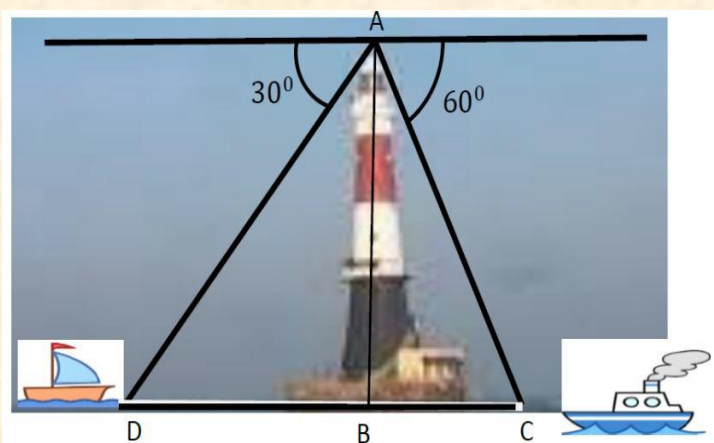(a) 0   (b) 1   (c) $\frac{4}{5}$ (d) $\frac{5}{8}$

Q9.

If $\sin 3A = 1$, then find the value of $\cos 2A - \tan^2 45°$.

Q10.

If $(\sec A + \tan A)(1 - \sin A) = k \cos A$, then find the value of k.

SOME APPLICATIONS OF TRIGONOMETY

1.

A lighthouse is a tall tower with light near the top. These are often built on islands, coasts or on cliffs. Lighthouses on water surface act as a navigational aid to the mariners and send warning to boats and ships for dangers. Initially wood, coal would be used as illuminators. Gradually it was replaced by candles, lanterns, electric lights. Nowadays they are run by machines and remote monitoring. Prongs Reef lighthouse of Mumbai was constructed in 1874-75. It is approximately 40 meters high and its beam can be seen at a distance of 30 kilometers. A ship and a boat are coming towards the lighthouse from opposite directions. Angles of depression of flash light from the lighthouse to the boat and the ship are 30° and 60° respectively.

Based on the above information answer the following questions:

(i) Which of the two, boat or the ship is nearer to the light house? Find its distance from the lighthouse?

(ii) Find the time taken by the boat to reach the light house if it is moving at the rate of 2 km per hour.

(iii) The ratio of the height of a light house and the length of its shadow on the ground is √3: 1. What is the angle of elevation of the sun?

2.

An injured bird was found on the roof of a building. The building is 15 m high. A fireman was called to rescue the bird. The fireman used an adjustable ladder to reach the roof. He placed the ladder in such a way that the ladder makes an angle of 60° with the ground in order to reach the roof.

Based on the above information, answer the following questions :

(i)   Find the length of the ladder used by the fireman to reach the roof.   *1*

(ii)   Find the distance of the point on the ground at which the ladder was fixed from the bottom of the building.   *1*

(iii) In order to avoid skidding, the fireman placed the ladder in such a way that the bottom of the ladder touches the base of the wall which is opposite to the building, making an angle of 30° with the ground.

(a)   Draw a neat diagram to represent the above situation and hence find the width of the road between the building and the wall.   *2*

OR

(b)   Find the length of the ladder used by the fireman in this case.   *2*

A drone is flying at a height of h metres. At an instant it observes the angle of elevation of top of an industrial turbine as 60° and angle of depression of foot of the turbine as 30°. If height of turbine is 200 metres, find the value of h and the distance of drone from the turbine.

(Use $\sqrt{3} = 1.73$)

PROBABILITY

Q1.Two dice are thrown at the same time.

(i) What is the probability that the sum of the two numbers appearing on the top of the dice is 8?

 (ii) What is the probability that the sum of the two numbers appearing on the top of the dice is7 ?

(iii) What is the probability that the sum of the two numbers appearing on the top of the dice is less than or equal to 12?

Q2. A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random

from the box, find the probability that it bears

(i)   a two-digit number . (ii)   a perfect square number. (iii) a number divisible by 5.

Q3.Two coins are tossed simultaneously. What is the probability of getting exactly one head?

Q4. A bag contains 15 white and some black balls. If the probability of drawing a black ball from the bag is thrice that of drawing a white ball, find the number of black balls in the bag.

Q5.

A lot consists of 200 pens of which 180 are good and the rest are defective. A customer will buy a pen if it is not defective. The shopkeeper draws a pen at random and gives it to the customer. What is the probability that the customer will not buy it ? Another lot of 100 pens containing 80 good pens is mixed with the previous lot of 200 pens. The shopkeeper now draws one pen at random from the entire lot and gives it to the customer. What is the probability that the customer will buy the pen ?

6.

The probability of getting a chocolate flavoured ice cream at random, in a lot of 600 ice creams is 0.055. The number of chocolate flavoured ice creams in the lot is :

(A)	33	(B)	55
(C)	11	(D)	44