Brain International School
Vikas Puri, New Delhi

REVISION SHEET

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

NUMBER SYSTEM

Q1) The value of $x^{a-b} . x^{b-c} . x^{c-a}$ is equal to

(a) x^{abc} (b) 0 (c) x (d) 1

Q2) If $x = 2 + \sqrt{3}$, then $\frac{1}{x}$ is equal to

(a) $2 + \frac{1}{\sqrt{3}}$ (b) $\frac{1}{2-\sqrt{3}}$ (c) $2 - \sqrt{3}$ (d) $\frac{1}{2} + \sqrt{3}$

Q3) If $x^2 + \frac{1}{x^2} = 38$, find (i) $x - \frac{1}{x}$ (ii) $x^3 - \frac{1}{x^3}$

Q4) Find the value of: $\frac{4}{216^{\frac{-2}{3}}} + \frac{1}{256^{\frac{-3}{4}}} + \frac{2}{243^{\frac{-1}{5}}}$

Q5) Represent $\sqrt{6.5}$ on the number line.

Q6) Simplify:

$$\frac{7\sqrt{3}}{\sqrt{10}+\sqrt{3}} - \frac{2\sqrt{5}}{\sqrt{6}+\sqrt{5}} - \frac{3\sqrt{2}}{\sqrt{15}+3\sqrt{2}}$$

Q7) Divide:

(i) √450 by √2 (ii) √135 by √5 (iii) √450 by √8

Q8) Simplify: $63\sqrt{3} + \sqrt{3} - 8\sqrt{27}$

Q9) If x= 2 + √3, find the value of (i) $(x+\frac{1}{x})^2$ (ii) $(x-\frac{1}{x})^4$ (answer : 16 and 144)

Q10) Write the following decimals in the form $\frac{p}{q}$

(i) 0.00875 (ii) $1.\bar{5}$ (iii) $2.7\overline{43}$

POLYNOMIALS

Q1) Factorise: $64a^2 + 96ab + 36b^2$

Q2) The coefficient of x^2 in the polynomial: $\sqrt{7}x^3 - 6x^2 + 2x - 4$ is

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

Q3) The value of k such that the polynomial $p(x) = 2x^3 - kx^2 + 3x + 10$ is exactly divisible by $(x + 2)$

(a) 3 (b) 6 (c) -3 (d) 0

Q4)) Factorise: $27x^3 + 1000y^3$

Q5) Without actually calculating the cubes , find the value of $(4)^3 + (-9)^3 + (5)^3$.

Q6) If $a-b = 7$ and $a^2 + b^2 = 85$, find $a^3 - b^3$.

Q7) If $x = 9 - 4\sqrt{5}$, find $x^2 - \frac{1}{x^2}$ and $x^3 + \frac{1}{x^3}$.

Q8) If the polynomial $4x^3 - 16x^2 + ax + 7$,is exactly divisible by x-1, then find the value of a. Hence factorise the polynomial.

Q9) If $4x^2 + 25y^2 = 41$ and $xy = 2$, find the value of $2x - 5y$.

Q10) If $a + b + c = 9$ *and* $2ab + 2bc + 2ca = 80$ then find the value of $a^2 + b^2 + c^2$.

Q11) If $2x^3 + ax^2 + bx - 6$ has (x-1) as a factor and leaves a remainder 2 when divided by (x-2) , find the values of a and b.

Q12) Expand: $(\frac{1}{4}a - \frac{1}{2}b + 1)^2$

Q13) Is 0 a polynomial? What is its degree?

COORDINATE GEOMETRY

1. In which quadrant or on which axis do each of the following point lie :

Verify your answer by locating them on the Cartesian plane.

(i) (- 2 , 4) (ii) (-1 , 0) (iii) (1 , 2)

(iv) (-3 , -5) (v) (0 , -4) (vi) (5 , 0)

2.Plot the points A (0, 5) , B (8, 0) , C (8, 5) and join them. What figure do you obtain ?

3. Plot the following points and check whether they are collinear or not.

(i) (1 , 3) , (-1 , -1) and (-2 , -3) (ii) (0 , 1) , (2 , -2) and (⅔ , 0)

4.Plot the point P (-4 , 5). Draw PM and PN perpendiculars to x-axis and y- axis respectively. State the coordinates of the points M and N.

5. Plot the points P (1 , 0) , Q (5 , 0) and S (1 , 4). Find the coordinates of the fourth point R, such that PQRS forms a square

6.Plot the points (0 , 0) , (3 , 0) , (3 , 2) and (0 , 2). Join them in order. Name the type of quadrilateral, based on your observation.

7.Write the coordinates of the vertices of a rectangle which is 6 units long and 4 units wide if the rectangle is in the first quadrant, its longer side lies on the x-axis and one vertex is at the origin.

8. Points A(5,3) , B(-2,3) and D (5,-4) are three vertices of a square ABCD. Plot these points on a graph paper and hence find the coordinates of vertex C.

LINEAR EQUATIONS IN TWO VARIABLES

1.Write each of the following as an equation in two variables. Also determine the values of a, b and c.

(i) $x = 7$ (ii) $2y = -5$

2. Find two solutions for the following equations :

(i) $2x + 5y = 9$ (ii) $5x + 3y = 14$

3.Find the value of a so that each of the following equations may have $x = 1, y = 1$ as a solution:

(i) $ax - 2y = 10$ (ii) $9ax + 12ay = 63$

4.A pen costs rupees 10 and a pencil costs rupees 2. Write an equation that represents the total money spent on buying different combinations of pens and pencils, if the total money spent is 110.

5.In a village primary school enrolment of girls has doubled this year as compared to last year. Considering this years enrolment as 'y' and previous years enrolment as 'x' form a linear equation for this information.

6. If k is the value of the ordinate where linear equation $4x+3y = 12$ cuts y axis , find the value of p if $(2p+4,7p-3)$ is solution of linear equation $7x + 9y = K$.

7. Determine the value of a if coordinate $(7a+3, 2a+13)$ lies on the line $y=2x$.

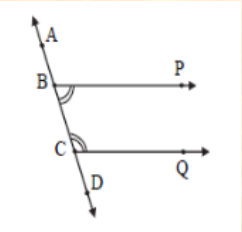
8.At what points the graph of the line $2x + 3y = 12$ intersects (i) x axis (ii) y axis

LINES AND ANGLES

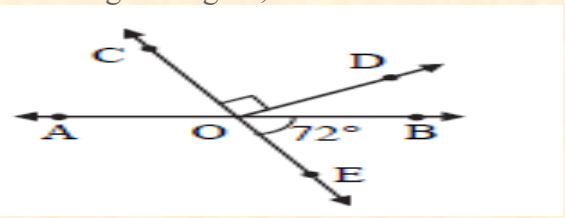
1.The supplementary angles are in the ratio 4:5, find the angles.

2.Find the measure of an angle , if seven times its complement is 10° less than three times its supplement.

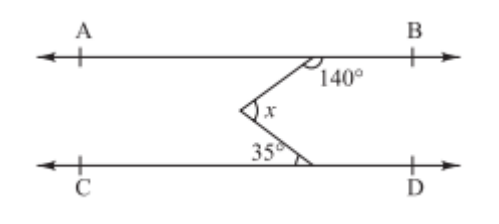
3.In the given figure, lines BP || CQ , if $\angle ABP = 105°$, find $\angle DCQ$



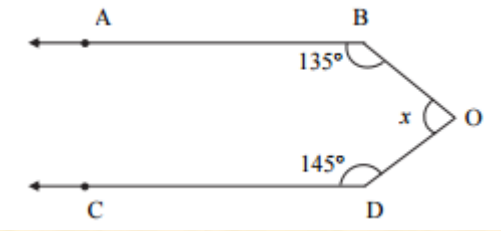
4.In the given figure, find ∠BOC?



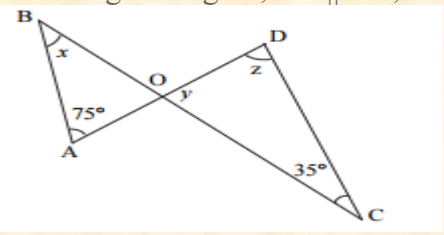
5. In the given figure, AB||CD, then find the value of x



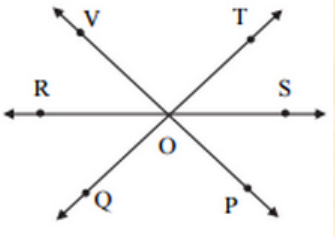
6.In the given figure AB || CD. Find the value of x?



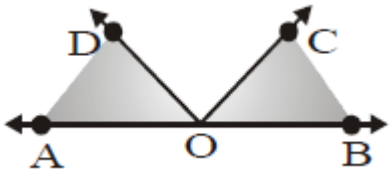
7.In the given figure, AB || CD, find the value y.



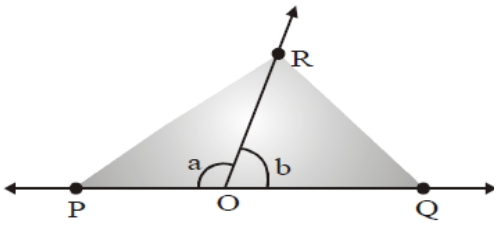
8. In the given figure, lines RS, VP and TQ intersect at point O, ∠VOS = 100°, ∠ROT = 122°. Find ∠ROQ?



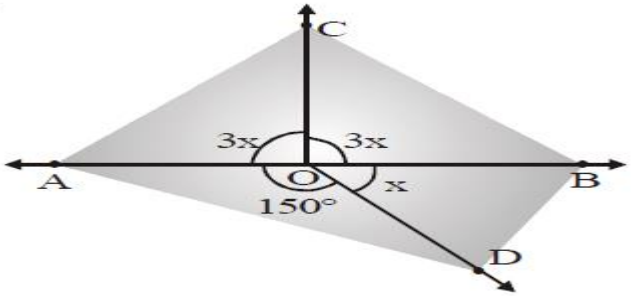
9. In figure write all pairs of adjacent angles and all the linear pairs.



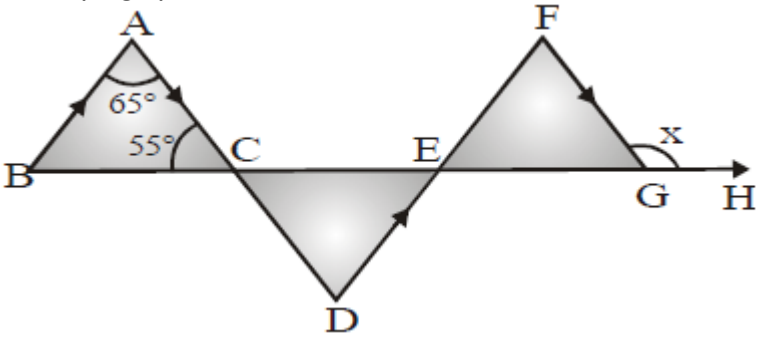
10.(angle)POR and (angle)QOR form a linear pair. If a – b = 80°, find the values of a and b.



11.In figure, determine the value of x.

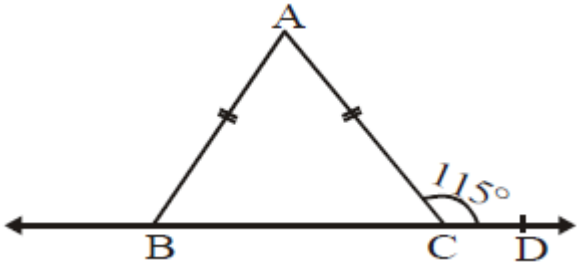


12. In figure if BA || DF, AD || FG, (angle)BAC = 65° and (angle)ACB = 55°, then find (angle)FGH.



TRIANGLES

1. In fig, AB = AC and ∠ACD = 115°. Find ∠A

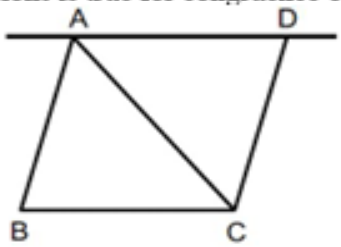


2. If ΔACB ≅ ΔEDF, then which of the following equations is/are true?
(I) AC = ED (II) ∠C = ∠F (III) AB = EF

(a) Only (I) (b) (I) and (III) (c) (II) and (III) (d) All of these

3.

In a triangle (as shown in fig). AB = CD, AD = BC and AC is the angle bisector of ∠A, then which among the following conditions is true for congruence of ΔABC and ΔCDA by SAS rule?



(a) ∠A = ∠D (b) ∠B = ∠A (c) ∠B = ∠D (d) ∠C = ∠A

4.

If AB = QR, BC = PR and CA = PQ in ΔABC and ΔPQR, then:

(a) ΔABC ≅ ΔPQR (b) ΔCBA ≅ ΔPRQ (c) ΔBAC ≅ ΔRPQ (d) ΔBCA ≅ ΔPQR

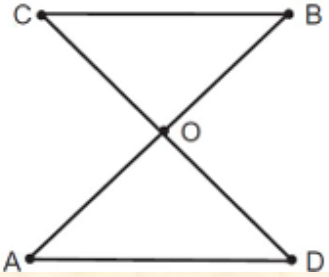
5.

Ritish wants to prove that ΔFGH ≅ ΔJKL using SAS rule. He knows that FG = JK and FH= JL. What additional piece of information does he need?

(a) ∠F = ∠J (b) ∠H = ∠L (c) ∠G = ∠K (d) ∠F = ∠G

6.

In the given figure two lines AB and CD intersect each other at the point O such that BC || AD and BC = DA. Show that O is the midpoint of both the line-segment AB and CD.



HERONS FORMULA

1.Find the area of a triangle whose perimeter is 180cm and two of its sides are 80cm and 18cm. Hence calculate the altitude of the triangle taking longest side as base.

2. The sides of a triangle are 39cm, 42cm and 45cm. A parallelogram stands on the greatest side of the triangle and has the same area as that of a triangle. Find the height of a parallelogram.

3. Find the cost of leveling a ground in the form of a triangle having its sides as 40m , 70m and 90m at rupees 8 per sq.m. (use $\sqrt{5}$ =2.24)

4.Using Heron's formula, find the area of an equilateral triangle of side 'a' units.

5. Find the area of equilateral triangle whose altitude is 6 cm.

6.Find the height of an equilateral triangle whose perimeter is 66cm.Calculate its area.