

Class: IX

Subject : Mathematics

Assignment No. 2

Co-ordinate geometry

- Name the quadrants in which the following points lie;
a) (5,-3) b) (-7,-7) c) (-5,7)
- On which axis do these points lie?
a) (-4,0) b) (0,6) c) (0,-1) (d) (3,0)
- Plot the following points on Cartesian plane;
a) A (4, 7) b) B (3,-5) c) C (9, 0)

Linear equations in two variables

- Find four different solutions of the equations:
a) $2x-7y=3$ b) $3x-5y=7$
- Draw the graph of the equation $2x-3y=5$. From the graph find
(i) The value of y when $x=4$.
(ii) The value of x when $y=3$.
- Give the equation of two lines passing through (4, 7). How many more such lines are there?
- Find the value of a so that $x=1, y=1$ is the solution of $9ax+12ay=63$
- Find the point of intersection of the line represented by the equation $7x+y=-2$ with x-axis. Check whether (2, 1) is a solution set of the given equation.

Introduction to Euclid's geometry

- Prove that two lines which are both parallel to the same line are parallel to each other.
- If lines AB, AC, AD and AE are all parallel to the same line l, then Show that the points A, B, C, D and E are collinear.

Lines and angles

- If a ray stands on a line, prove that the sum of the angle bisectors of the adjacent angles so formed is 90° .
- Ray OC is perpendicular to the line AB at O. Another ray OD is lying between rays OB and OC. Prove that $\angle COD = \frac{1}{2}(\angle AOD - \angle BOD)$
- Given $\angle BAC = 78^\circ$ and BA is produced to D. If ray AE bisects angle CAD, then find angle BAE and reflex angle DAE
- If each angle of a triangle is less than the sum of the other two, then show that the triangle is an acute angled triangle.
- In $\triangle PQR$, If PM is perpendicular to QR and PN is the bisector of $\angle P$, then prove that $\angle MPN = \frac{1}{2}(\angle B - \angle C)$.
- If in a quadrilateral ABCD, the bisectors of $\angle A$ and $\angle D$ intersect at point P, then prove that $2\angle APD = \angle B + \angle C$
- If AB is parallel to CD and P is a point between them, prove that $\angle ABP + \angle BDP + \angle CDP = 360^\circ$.

Triangles

1. If $\triangle ABC$ and $\triangle DBC$ are isosceles triangles on the same base BC , then show that the line joining AD bisects the common base at right angles.
2. If $ABCD$ is a square and P is a point inside it such that $PB=PD$, then prove that C, P, A is a straight line.
3. If ABC is an equilateral triangle, P and Q are points on BC and AB such that PQ is parallel to AC and AC is produced to R such that $CR=BP$, then prove that QR bisects PC .
4. If the bisector of the vertical angle of a triangle bisects the base, then prove that it is an isosceles triangle.
5. Show that the sum of three altitudes of a triangle is less than the sum of the three sides of the triangle.
6. If In $\triangle ABC$, D is a point on AC such that $AB=AD$, then prove that $BC>CD$.
7. Prove that the line segment joining the midpoints of the diagonals of a trapezium is parallel to each of the parallel sides and is equal to half the difference between the lengths of the two parallel sides.

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