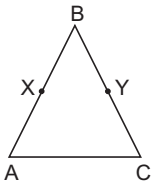
WORKSHEET 5

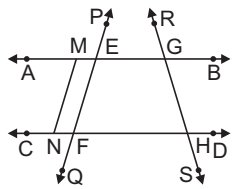
CHAPTER 5 – INTRODUCTION TO EUCLID'S GEOMETRY

1. It is known that $x + y = 10$ and that $x = z$. Show that $z + y = 10$.

2. In the given figure, we have AB = BC, BX = BY. Show that AX = CY.



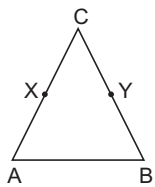
3. In the adjoining figure, name:
   (*i*) six points
   (*ii*) five line segments
   (*iii*) four rays
   (*iv*) four lines
   (*v*) four collinear points.



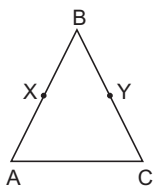
4. (*i*) How many lines can pass through a given point?
   (*ii*) In how many points can two distinct lines at the most intersect?

5. (*i*) Given two points P and Q , how many line segments do the determine.
   (*ii*) Name the line segment determined by the three collinear points P, Q and R.

6. In the given figure, X and Y are the mid-points of AC and BC and AX = CY. Show that AC = BC.



7. In the given figure, BX = $\frac{1}{2}$ AB, BY = $\frac{1}{2}$ AC and AB = BC. Show that BX = BY.

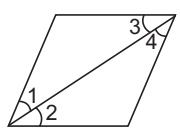


8. Ram and Ravi have the same weight. If the each gains weight by 2 kg, how will their new weights be compared?

9. Solve the equation $a - 15 = 25$ and state which axiom do you use here.

10. Which of the following statements are true or false?
   (*i*) A line segment has no definite length.
   (*ii*) A ray has no end point.
   (*iii*) A line has a definite length.
   (*iv*) A line $\overleftrightarrow{AB}$ is the same as line $\overleftrightarrow{BA}$.

11. In the given figure, if $\angle 1 = \angle 3$, $\angle 2 = \angle 4$ and $\angle 3 = \angle 4$, then write the relation between $\angle 1$ and $\angle 2$, using Euclid's axiom.



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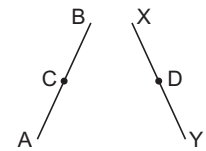
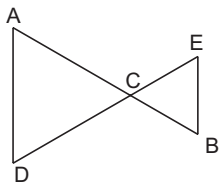
12. Check whether the given system of axioms is consistent or inconsistent.
   (*i*) Things which are equal to the same thing are equal to one another.
   (*ii*) If equals are added to equals, the wholes are equal.
   (*iii*) Things which are double of the same thing are equal to one another.

13. In the adjoining figure, show that length AH > length of AB + BC + CD.

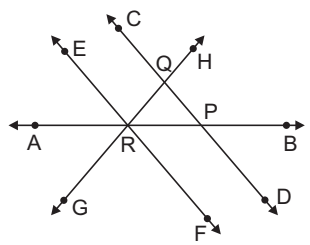
14. In the given figure, AC = XD, C is the mid-point of AB and D is the mid-point of XY. Show that AB = XY.



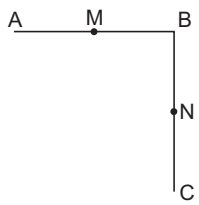
15. In the given figure, AC = DC and CB = CE. Show that AB = DE.



16. In the adjoining figure, name:
   (i) Two pairs of intersecting lines and their corresponding points of intersection.
   (*ii*) Three concurrent lines and their points of intersection.
   (*iii*) Three rays
   (*iv*) Two line segments

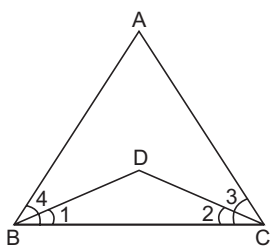


17. In the given figure,
   (*i*) AB = BC, M in the mid-points of AB and N is the mid-point of BC. Show that AM = NC.
   (*ii*) BM = BN, M is the mid-point of AB and N is the mid-point of BC. Show that AB = BC.



18. Fill in the blanks so as to make the following statements true:
   (*i*) Two distinct points in a plane determine a …… line.
   (*ii*) Two distinct …… in a plane cannot have more than one point in common.
   (*iii*) Given a line and a point, not on the line, there is one and only …… line which passes through the given point and is …… to the given line.
   (*iv*) A line separates a plane into …….. parts namely the …… and the …… itself.

19. In the given figure, ∠ABC = ∠ACB and∠3 = ∠4. Show that ∠1 = ∠2.



20. If lines AB, AC, AD and AE are parallel to a line *l*, show that the points A, B, C, D, E are collinear.

ANSWERS

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3. (*i*) A, B, C, D, E, F (*ii*) $\overline{EG}$, $\overline{FH}$, $\overline{EF}$, $\overline{GH}$, $\overline{MN}$

(*iii*) $\overrightarrow{EP}$, $\overrightarrow{GR}$, $\overrightarrow{GB}$, $\overrightarrow{HD}$ (*iv*) $\overleftrightarrow{AB}$, $\overleftrightarrow{CD}$, $\overleftrightarrow{PQ}$, $\overleftrightarrow{RS}$ (*v*) M, E, G, B

4. (*i*) Infinitely many (*ii*) One

5. (*i*) One (*ii*) PQ, QR, PR

8. The weight of Ram and Ravi gain equal by using Euclid's second axiom.

9. Euclid's second axiom has been used here.

10. (*i*) False (*ii*) False (*iii*) False (*iv*) True

11. $\angle 1 = \angle 2$

12. Consistent

16. (*i*) $\{\overleftrightarrow{EF}, \overleftrightarrow{GH}, R\}, \{\overleftrightarrow{AB}, \overleftrightarrow{CD}, P\}$ (*ii*) $\overleftrightarrow{AB}$, $\overleftrightarrow{EF}$, $\overleftrightarrow{GH}$, R

(*iii*) $\overrightarrow{RB}$, $\overrightarrow{RH}$, $\overrightarrow{RG}$ (*iv*) $\overline{RQ}$, $\overrightarrow{RP}$

18. (*i*) unique (*ii*) lines

(*iii*) perpendicular, perpendicular (*iv*) three, two half planes, line