MATHS

BOOKS - MODERN PUBLICATION

INTRODUCTION TO EUCLID'S GEOMETRY

EXAMPLE

1. Two lines, which are both parallel to the same line, are parallel to each other, prove

that.

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2. If the lines AB and AC are parallel to a line l, show that the points A,B and C are collinear.

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3. The following statement is true or false ? Give reasons for your answer : Only one line can pass through a single point.

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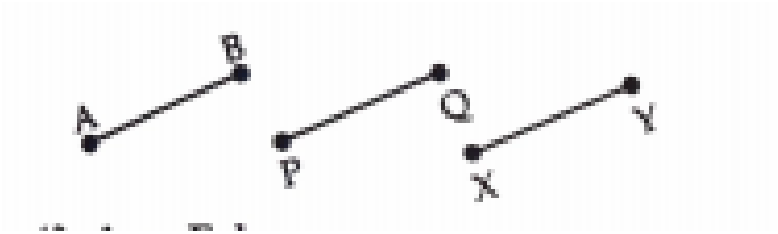
4. Which of the following statements are true and which are false? Give reasons for your answer



There are in infinite number of lines which pass through two distinct points.

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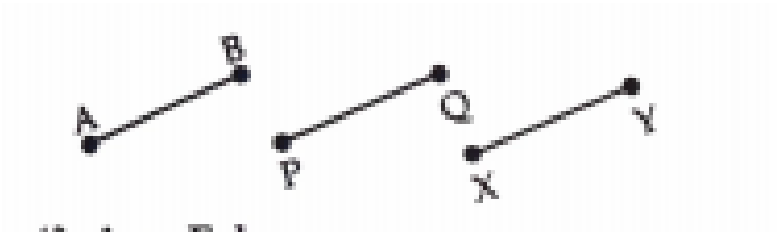
5. Which of the following statements are true and which are false? Give reasons for your answer



A terminated line can be produced indefinitely on both the sides.

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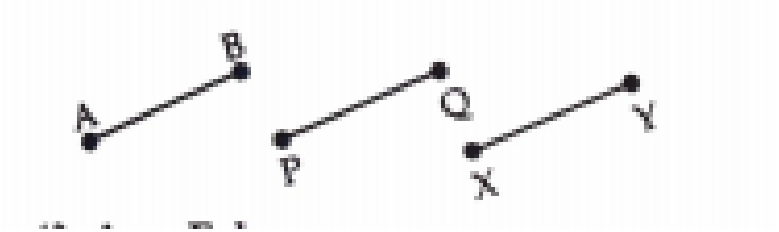
6. Which of the following statements are true and which are false? Give reasons for your

answer



If two circles are equal, then their radii are equal

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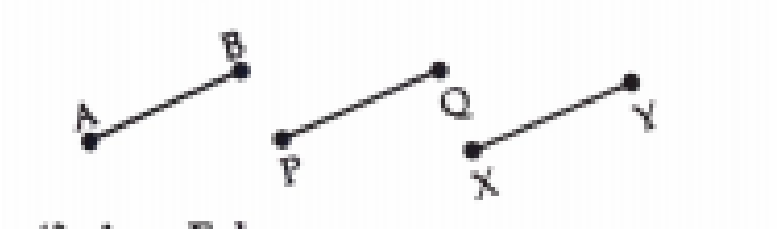
7. Which of the following statements are true and which are false? Give reasons for your answer



In fig. if AB=PQ and PQ=XY, then AB=XY.

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8. Give a definition for each of the following terms. Are three other terms that need to be defined first? What are they, and how might you define them?

parallel line?

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9. Give a definition for the following term. Is there other term that need to be defined first ? What is it and how might you define it ? Perpendicular Lines.

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10. Give a definition for the following term. Is there other term that need to be defined first

? What is it and how might you define it ?

Lines Segment.

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11. Give a definition for each of the following terms. Are three other terms that need to be defined first? What are they, and how might you define them?

parallel line?

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12. Give a definition for the following term. Is there other term that need to be defined first ? What is it and how might you define it ? Square.

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13. Consider 'postulate' given below. Given any two distinct points A and B, there exists a third point C which is between A and B. Do this postulate contains any undefined term ? Is

this postulate consistent ? Do they follow from Euclid's postulate ? Explain.

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14. Consider 'postulate' given below. There exist at least three points that are not on the same line. Do this postulate contains any undefined term ? Is this postulate consistent ? Do they follow from Euclid's postulate ? Explain.

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15. If a point C lies between two points A and B such that AC = BC, then prove that $AC = \frac{1}{2}AB$. Explain by drawing the figure.

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16. Show that every line segment has one and only one middle point.

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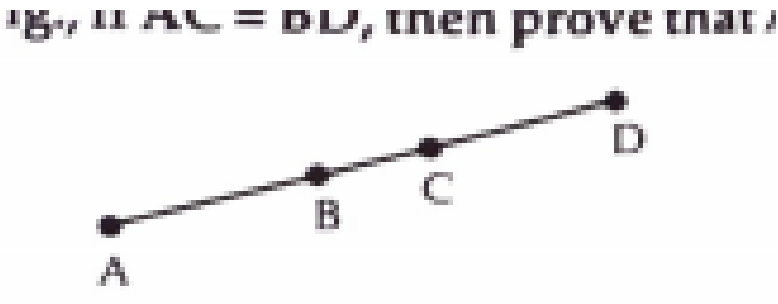
17. In fig. if AC=BD, then prove that AB=CD



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18. Why is axiom 5, in the list of Euclid's axioms, considered as a 'universal truth' ?

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19. How would you rewrite Euclid's fifth postulate so that it would be easier to understand ?

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20. Does Euclid'sfifth postulate imply the existence of parallel lines ? Explain.

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21. Euclidean geometry is valid only for curved surfaces.

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22. The boundaries of the solids are curves.

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23. Write True or False and Justify Your answer

The edges of a surface are curves.

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24. The things which are double of the same thing are equal to one another.

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25. If a quantity B is a part of another quantity A, then A can be written as the sum of B and some third quantity C.

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26. The statements that are proved are called axioms.

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27. "For every line l and for every point P not lying on a given line l, there exists a unique line m passing through P and parallel to l" is known as Playfair's axiom.

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28. Two distinct intersecting lines cannot be parallel to the same line.

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29. Attempts to prove Euclid's fifth postulate using the other postulates and axioms led to the discovery of several other geometries.

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30. Two salesman make equal sales during the month of August, in september, each salesman doubles his sale of the month of August. Compare their sales in September.

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31. It is known that $x+y=10$ and that $x=z$. show that $z+y=10$?

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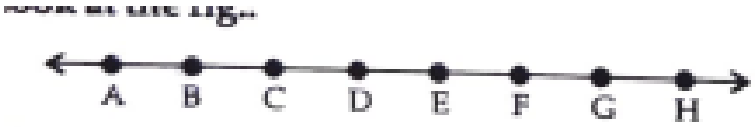
32. Look at the fig.



show that AH> sum of lenghts of AB+BC+CD

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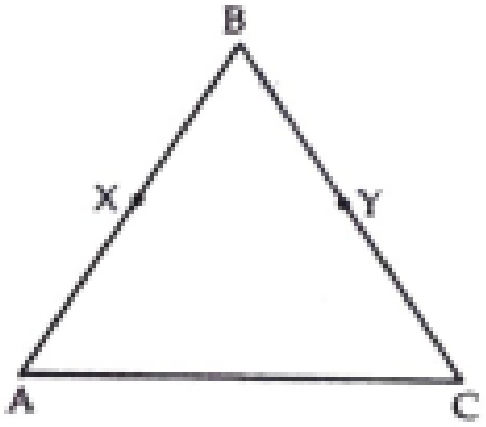
33. In the fig. we have AB=BC,BX=BY. Show that AX=CY.



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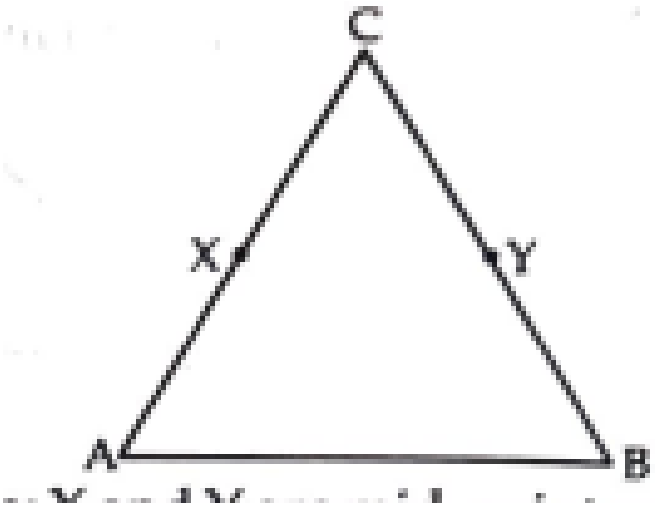
34. In the fig. we have X and Y are the mid points of AC and BC and AX=CY. Show that

AC=BC



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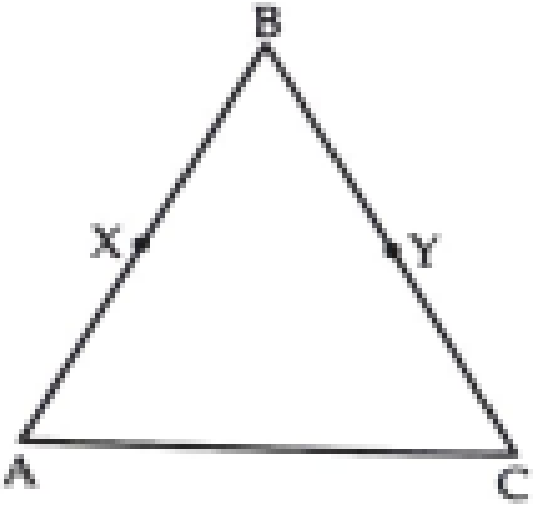
35. In the fig. we have $BX = \frac{1}{2}AB$, $BY = \frac{1}{2}BC$ and AB=BC. Show that BX=BY

AB = BC. Show that BX = BY.



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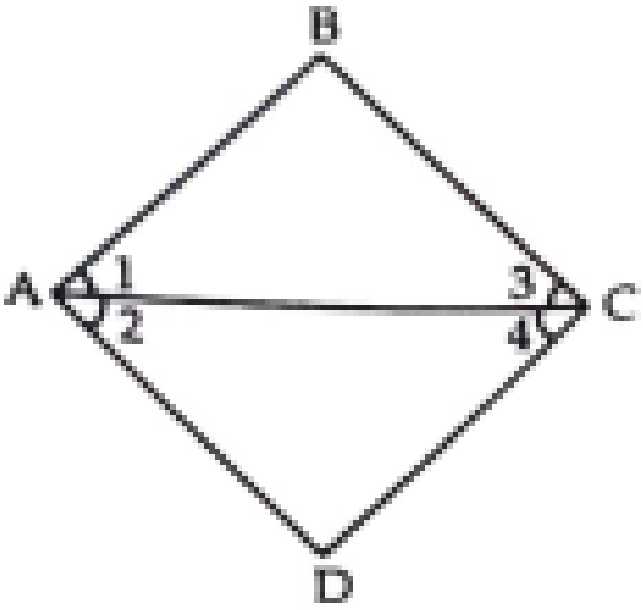
36. In the fig. we have $\angle 1 = \angle 2, \angle 2 = \angle 3.$

Show that $\angle 1 = \angle 3$



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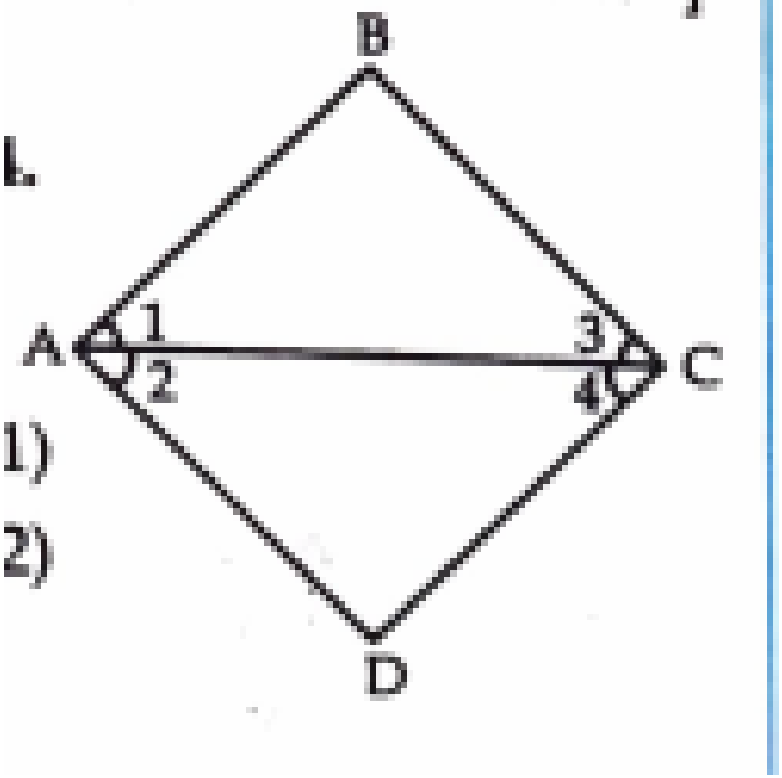
37. In the fig. we have $\angle 1 = \angle 3$ and $\angle 2 = \angle 4$

show that $\angle A = \angle C$



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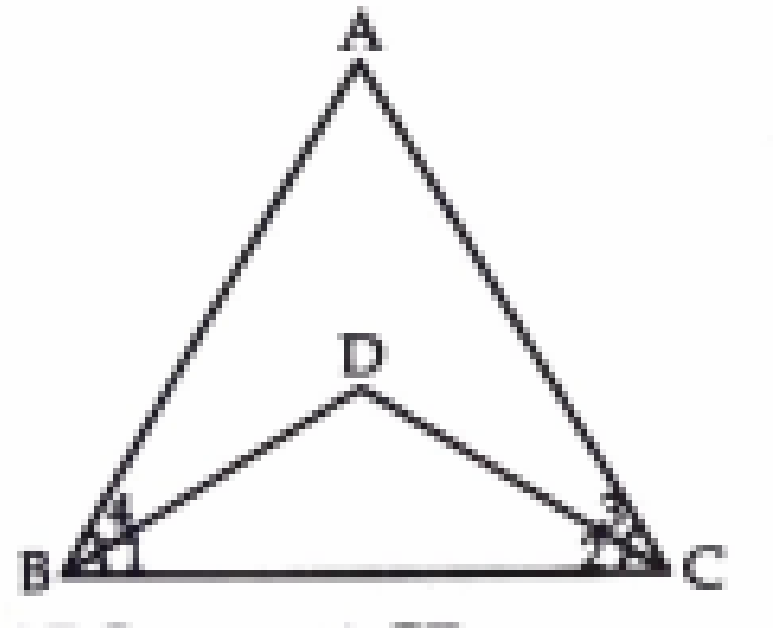
38. In the fig. we have $\angle ABC = \angle ACB$ and $\angle 3 = \angle 4$ show that $\angle 1 = \angle 2$



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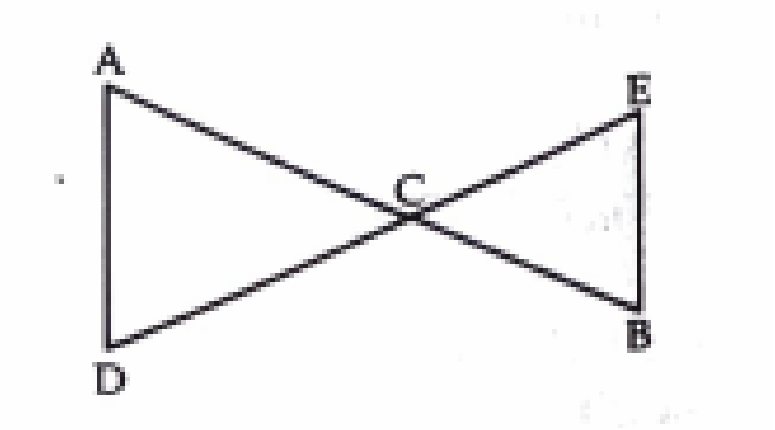
39. In the fig. we have AC=DC,CB=CE

show that AB=DE



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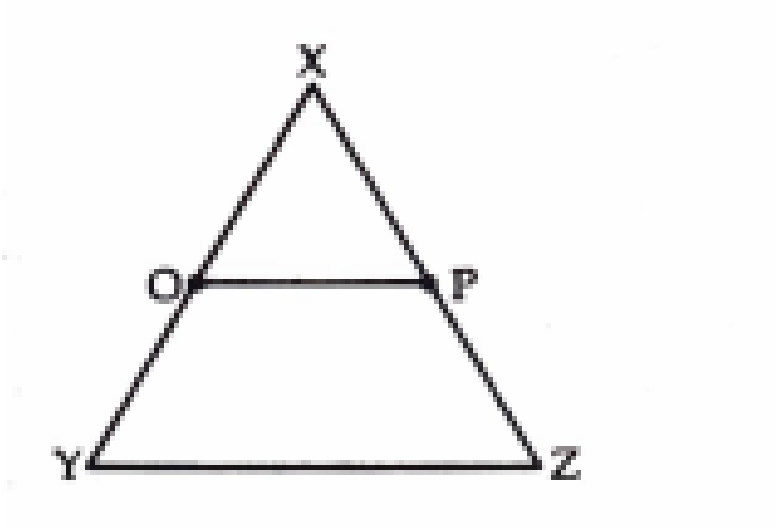
40. In the fig. if $OX = \frac{1}{2}XY, PX = \frac{1}{2}XZ$ and OX=PX show that XY=XZ



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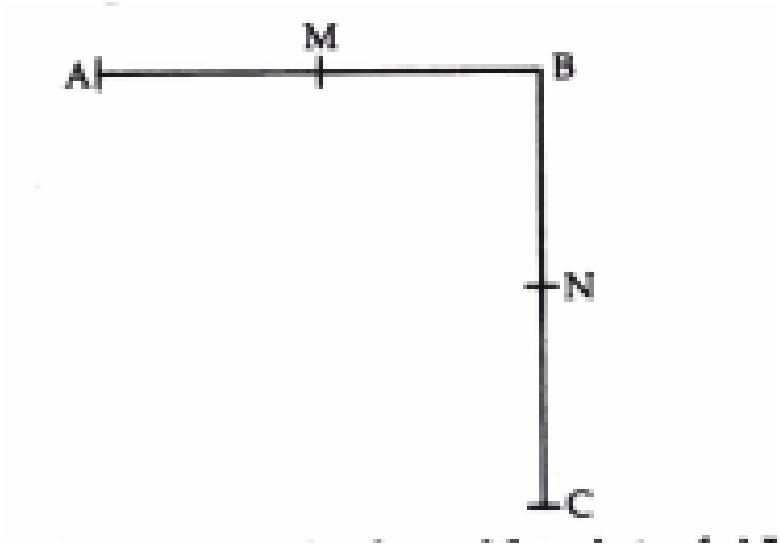
41. In the fig.



BM=BN, M is the mid point of AB and N is the mid point of BC. Show that AB=BC

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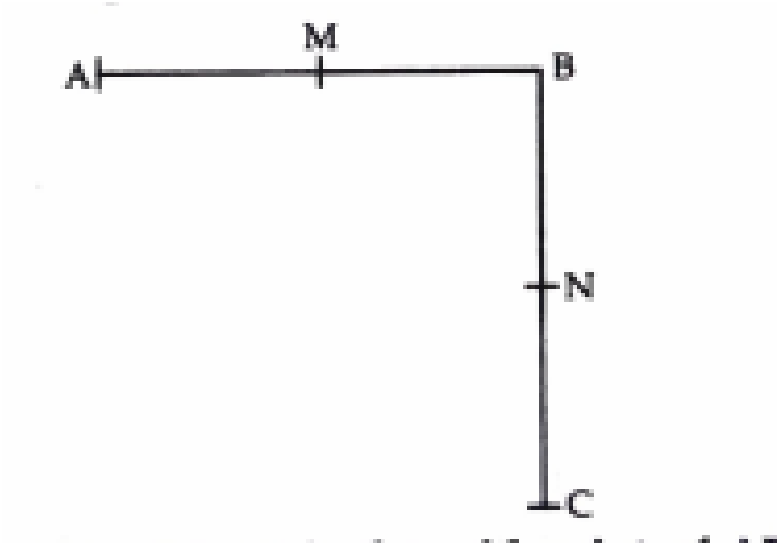
42. In the fig.



BM=BN, M is the mid point of AB and N is the mid point of BC. Show that AB=BC

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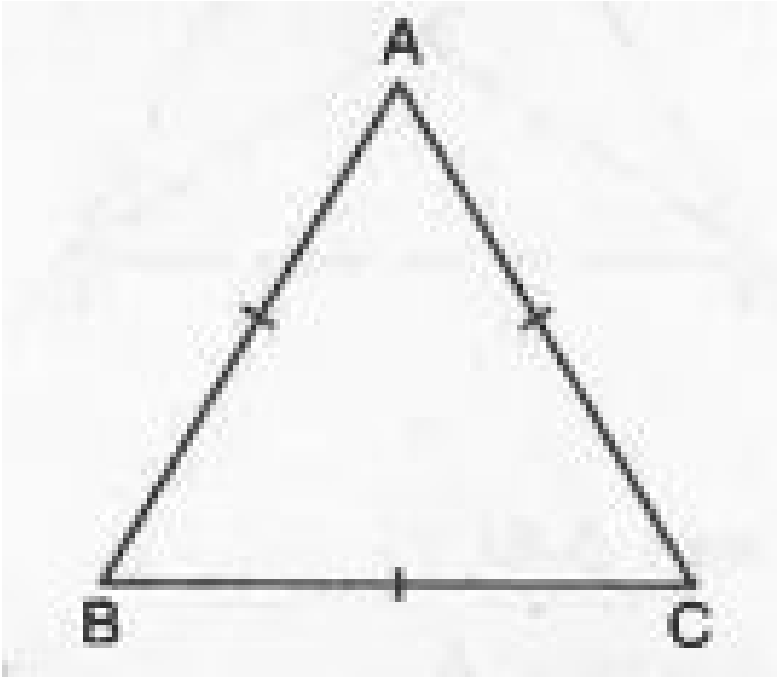
43. Show that the angles of an equilateral triangle are 60° each.



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44. Two distinct intersecting lines cannot be parallel to the same line.

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45. If a transversal intersects two parallel line then corresponding angles are an necessarily equal.

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46. If a transversal intersects a pair of lines in such a way that a pair of alternate angles are equal, then two lines are ..... .

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47. If two lines intersect, then vertically opposite angles are..... .

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48. If a ray stands on a line, then the sum of angles so formed is equal to 10°. Is this system of axioms consistent? Justify your answer.

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49. The things which are double of the same thing are equal to one another.

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50. If equals are added to equals the wholes are equal.

51. The things which are double of the same thing are equal to one another.

EXERCISE

1. Explain the difference between an axiom and a theorem.

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2. Define the following

Ray?

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3. Define the following

Line segment?

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4. Define the following

Half-line?

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5. Define the following

Parallel lines.

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6. Define the following

Intersecting lines.

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7. Define the following

Concurrent lines.

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8. Define the following

Collinear points

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9. Define the following terms

Planet

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10. How many lines can pass through a given point?

A. 1

B. 2

C. 5

D. infinite

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11. How many circles can be drawn to pass through two given points?

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12. How many points can be two distinct lines intersect at the most?

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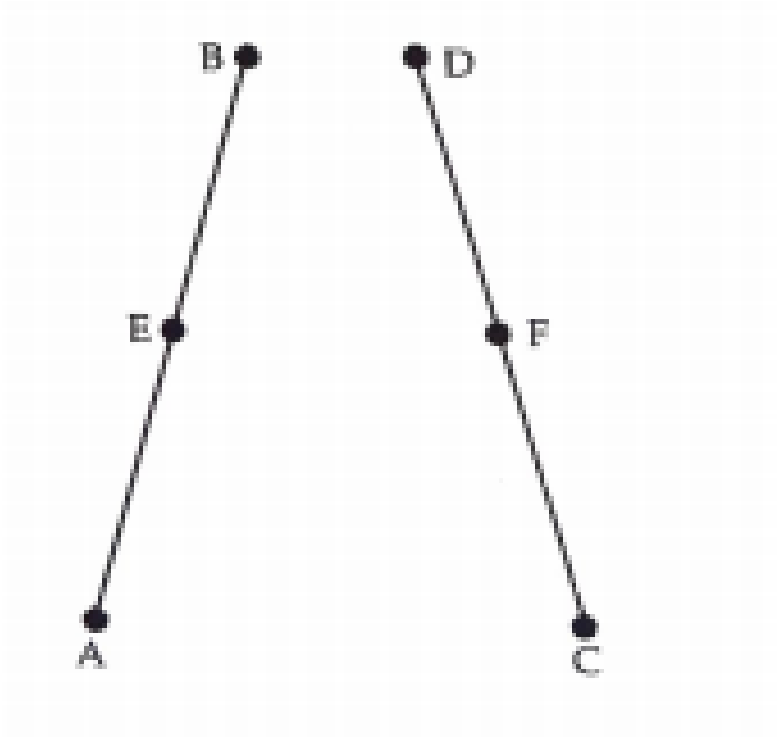
13. In the fig. AE=DF where E and F are mid-points of AB and DC respectively.Using Euclid's axiom, prove that AB=DC



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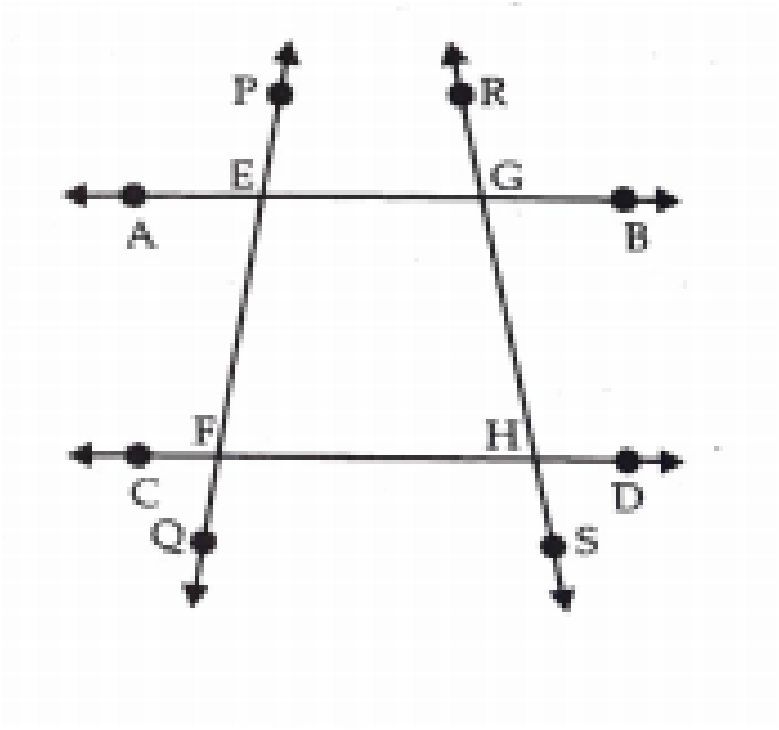
14. In the fig. name



six points, four line segments, four rays, three collinear points.

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15. How many lines can pass through a given point?

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16. How many lines can pass through two given points?

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17. How many points can be two distinct lines intersect at the most?

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18. How many points can be two distinct lines intersect at the most?

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19. How many planes can be made to pass through three distinct points?

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20. Show that every line segment has one and only one middle point.

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21. Define parallel lines.

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22. Define concurrent forces and describe equilibrium of concurrent forces.

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23. If l, m and n are three straight lines such that $l \| m$ and $l \| n$ then prove that $m \| n$.

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24. In the fig. if PR=QS prove that PQ=RS

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25. A,B and C are three collinear points. How many line segment can be determined by them? Name these lines segments?

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26. Euclidean geometry is valid only for curved surfaces.

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27. Write True or False and Justify Your answer

The edges of a surface are curves.

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28. The statements that are proved are called axioms.

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29. Two distinct intersecting lines cannot be parallel to the same line.

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30. If a quantity B is a part of another quantity A, then A can be written as the sum of B and some third quantity C.

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31. Fill ups

A line segment has.....end points.

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32. Fill ups

Rectilinear figures are formed by..... .

 Watch Video Solution

33. Fill ups

Two lines in a plane not having any common points are called.....lines.

 Watch Video Solution

34. Fill ups

Concurrent lines.....passing through a given point.

Watch Video Solution

35. Two distinct points in a plane determine a ..... Line.

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36. Who out of the following presented geometry in most systematic form?

A. thales

B. plato

C. Pythagoras

D. Euclid

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37. Which out of the follwong mathematician gave first known proof?

A. Euclid

B. Plato

C. Pythagoras

D. thales

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38. Axioms are

A. self evident trught applicable to mathematics in general

B. self evident truth which are geometry specific `

C. theorem

D. definitions

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39. Postulates are

a. self evident truths which are generaly sepcific

b. self evident truths which are applicable to mathematics in general

c. proofs

d. theorem.

A. self evident truths which are generaly sepcific

B. self evident truths which are applicable to mathematics in general

C. proofs

D. theorem.

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40. Which of the following order is as per ascending order of dimensions.

A. Point $\rightarrow$ lines $\rightarrow$ surfaces $\rightarrow$ solids

B. solids $\rightarrow$ surfaces $\rightarrow$ lines $\rightarrow$ points

C. lines $\rightarrow$ points $\rightarrow$ solids $\rightarrow$ surfaces

D. lines $\rightarrow$ surfaces $\rightarrow$ points $\rightarrow$ solids

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41. Which of the follwong solid figure does not exist?

A. 1) pyramid with triangular base

B. 2) pyramid with circular base

C. 3) pyramid with square base

D. 4) pyramid with pentagonal base.

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42. Euclid's definitions of surface is that which has

A. length only

B. breadth only

C. breadthless length

D. length and breadth only

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43. Terminated lines according to Eculid's postulates be produced

A. to a finite length

B. indefinitely

C. not to be produced in either direction

D. along one side to a finite length

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44. Playfair's axiom states that

A. things which are halves of same things equal to one another

B. the distance between a pair of parallel inform straight lines may fluctate but remains lens than a certain fixed distances

C. if a striaght line falling on two straight lines makes the interior angles

D. for every line l and for every point P not lying on l.

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45. Thales belongs to the country :

A. Babylonia

B. Egypt

C. Greece

D. Rome

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46. Euclid belongs to the country :

A. India

B. Greece

C. Egypt

D. Babylonia

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47. Pythagoras was a student of :

A. thales

B. euclid

C. Archemides

D. none of these

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48. In Indus Valley Civilisation (about 300 B.C.), the bricks used for construction work were having dimensions in the ratio :

A. $4:3:1$

B. $4:3:2$

C. $4:2:1$

D. $4:4:1$

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49. Euclid stated that all right angles are equal to each other in the form of :

A. an axiom

B. a definition

C. a postulate

D. a proof

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50. Greek's emphasised on :

A. inductie reasoning

B. deductve reasoning

C. practical use of geometry

D. analytical geometry

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51. The three steps from solids to points are :

A. solids,surfaces,lines-points

B. solids-lines-surfaces-points

C. lines-points-surfaces-solids

D. line-surfaces-points-solids

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52. The number of dimensions, a solid has :

A. 1

B. 2

C. 3

D. 0

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53. The number of dimensions, a surface has :

A. 1

B. 3

C. 2

D. 0

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54. The number of dimensions, a point has :

A. 0

B. 1

C. 2

D. 3

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55. Euclid divided his famous treatise “The Elements” into :

A. 13 chapter

B. 12 chapters

C. 11 chapters

D. 9 chapters

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56. The total number of propositions in the Elements are :

A. 465

B. 460

C. 13

D. 55

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57. Boundaries of solids are :

A. surfaces

B. curves

C. lines

D. points

Watch Video Solution

58. Boundaries of surfaces are :

A. surfaces

B. curves

C. lines

D. points

Watch Video Solution

59. In Indus Valley Civilisation (about 300 B.C.), the bricks used for construction work were having dimensions in the ratio :

A. $1:3:4$

B. $4:2:1$

C. $4:4:1$

D. $4:3:2$

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60. A pyramid is solid figure, the base of which is :

A. only a triangle

B. only a square

C. only a rectangle

D. any polygon

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61. The side faces of a pyramid are :

A. Triangles

B. Squares

C. Polygons

D. Trapezium

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62. It is known that if $x + y = 10$ then $x + y + z = 10 + z$. The Euclid's axiom that illustrates this statement is :

A. First Axiom

B. Second Axiom

C. Thrid Axiom

D. Fourth Axiom

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63. In ancient India, the shapes of altrars used for house hold rituals were :

A. squares and rectangles

B. tringles and rectangles

C. trapezium and pyramids

D. rectangles and squares

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64. The number of interwoven isosceles triangles in Sriyantra (in the Atharvaveda) is :

A. Seven

B. Eight

C. Nine

D. Eleven

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65. Greek's emphasised on :

A. Inductive reasoning

B. Deductive reasoning

C. Both a and B

D. practical use of geometry

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66. In Ancient India, Altars with combination of shapes like rectangles, triangles and trapeziums were used for :

A. public worship

B. household worship

C. Both a and b

D. nOne of a,b and c

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67. Euclid belongs to the country :

A. Babylonia

B. Egypt

C. Greece

D. India

 Watch Video Solution

68. Thales belongs to the country :

A. Babylonia

B. Egypt

C. Greece

D. India

Watch Video Solution

69. Pythagoras was a student of :

A. Thales

B. Euclid

C. Both a and b

D. Archimedes

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70. Which of the following needs a proof ?

A. Theroem

B. Axiom

C. Definitions

D. Postulate

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71. Euclid stated that all right angles are equal to each other in the form of :

A. an axiom

B. a definition

C. a postulate

D. a proof

Watch Video Solution

72. Lines are parallel if they do not intersect is stated in the form of :

A. an axiom

B. a definitions

C. a postulate

D. a proof

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73. If the lines AB and AC are parallel to a line l, show that the points A,B and C are collinear.

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74. How would you rewrite Euclid's fifth postulate so that it would be easier to understand ?

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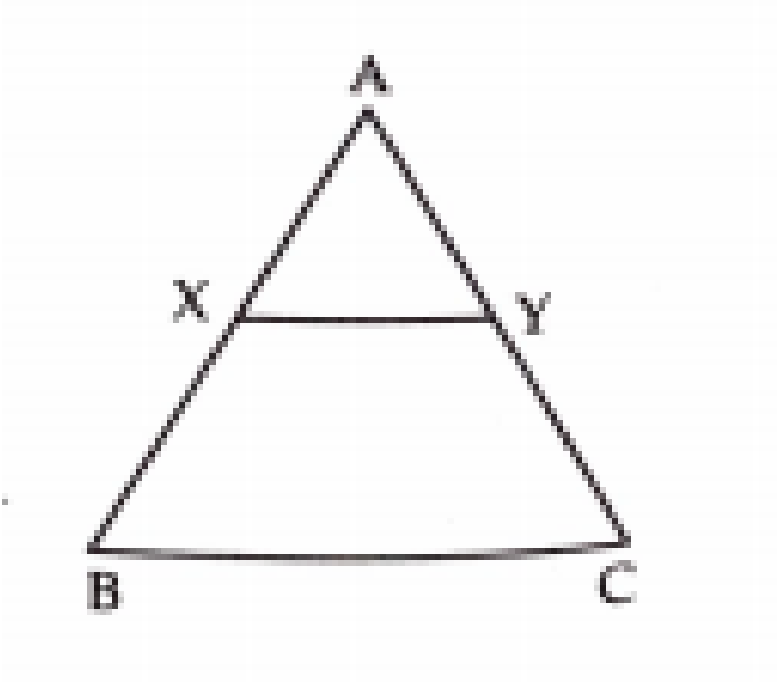
75. In the fig. $AX = \frac{1}{2}AB$, $AY = \frac{1}{2}AC$ and AX=AY, prove that AB=AC



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76. Two distinct lines in a plane can have two points in common.

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77. It is known that $x+y=10$ and that $x=z$. show that $z+y=10$?

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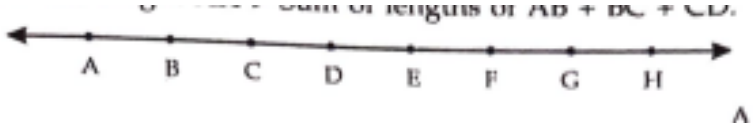
78. Look at the figures. Show that the length

AH> sum of lenghts of AB+BC+CD



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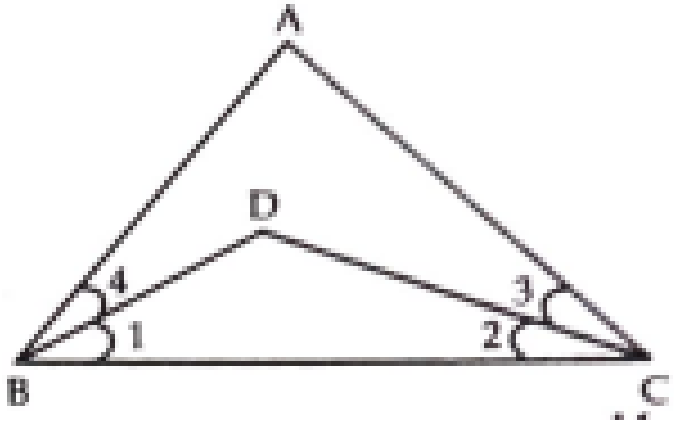
79. In fig. $\angle ABC = \angle ACB$ and $\angle 3 = \angle 4$.

Prove that $\angle 1 = \angle 2$



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80. If a transversal intersects two parallel line then corresponding angles are an necessarily equal.

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81. If a ray stands on a line, then the sum of angles so formed is equal to 10°. Is this system of axioms consistent? Justify your answer.

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82. If two lines intersect, then vertically opposite angles are..... .

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83. If a ray stands on a line, then the sum of the two adjacent angles so formed is..... .

84. The things which are double of the same thing are equal to one another.

85. If equals are added to equals the wholes are equal.

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86. The things which are double of the same thing are equal to one another.

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