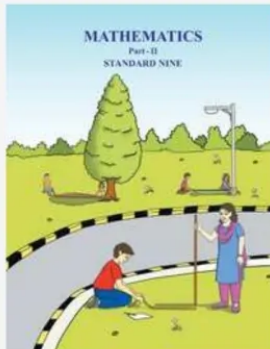


# Maharashtra Board Solutions Class 9-Maths

## (Part 2): Chapter 2.2- Parallel Lines

BOOK SOLUTIONS  
**CLASS 9**  
MATHS (PART 2)

CHAPTER 2.2  
**Parallel Lines**



Maharashtra Board Solutions→

For any clarifications or questions you can write to [info@indcareer.com](mailto:info@indcareer.com)

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# Maharashtra Board Solutions Class 9-Maths

## (Part 2): Chapter 2.2- Parallel Lines

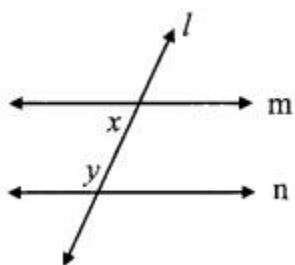
Class 9: Maths Chapter 2.2 solutions. Complete Class 9 Maths Chapter 2.2 Notes.

### Maharashtra Board Solutions Class 9-Maths (Part 2): Chapter 2.2- Parallel Lines

Maharashtra Board 9th Maths Chapter 2.2, Class 9 Maths Chapter 2.2 solutions

#### Question 1.

In the given figure,  $y = 108^\circ$  and  $x = 71^\circ$ . Are the lines  $m$  and  $n$  parallel? Justify?



#### Solution:

$$y = 108^\circ, x = 71^\circ \dots [\text{Given}]$$

$$x + y = 71^\circ + 108^\circ$$

$$= 179^\circ$$

$$\therefore x + y = 180^\circ$$

$\therefore$  The angles  $x$  and  $y$  are not supplementary.

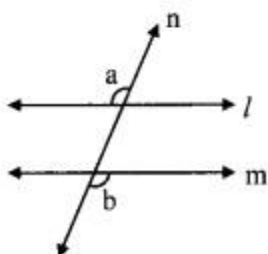
$\therefore$  The angles do not satisfy the interior angles test for parallel lines

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$\therefore$  line m and line n are not parallel lines.

### Question 2.

In the given figure, if  $\angle a = \angle b$  then prove that line l || line m.

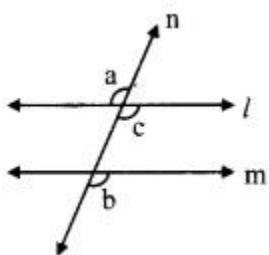


**Given:**  $\angle a \cong \angle b$

**To prove:** line l || line m

**Solution:**

Proof:



consider  $\angle c$  as shown in the figure  $\angle a \cong \angle c$  ..... (i) [Vertically opposite angles]

But,  $\angle a \cong \angle b$  I (ii) [Given]

$\therefore \angle b \cong \angle c$  [From (i) and (ii)]

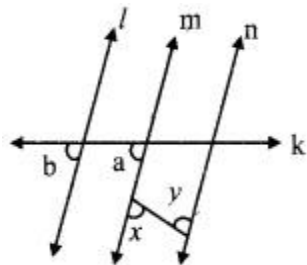
But,  $\angle b$  and  $\angle c$  are corresponding angles on lines l and m when line n is the transversal.

$\therefore$  line l || line m. [Corresponding angles test]

### Question 3.

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In the given figure, if  $\angle a \cong \angle b$  and  $\angle x \cong \angle y$ , then prove that line  $l \parallel$  line  $n$ .

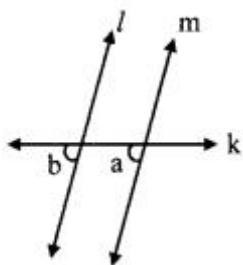


Given:  $\angle a \cong \angle b$  and  $\angle x \cong \angle y$

To prove: line  $l \parallel$  line  $n$

**Solution:**

Proof:



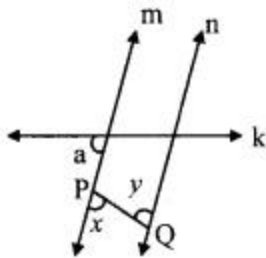
$\angle a = \angle b$  [Given]

But,  $\angle a$  and  $\angle b$  are corresponding angles on lines  $l$  and  $m$  when line  $k$  is the transversal.

$\therefore$  line  $l \parallel$  line  $m$  ....(i) [Corresponding angles test]

$\angle x \cong \angle y$  [Given]

But,  $\angle x$  and  $\angle y$  are alternate angles on lines  $m$  and  $n$  when seg  $PQ$  is the transversal,



$\therefore$  line  $m \parallel$  line  $n$  .....(ii) [Alternate angles test]

$\therefore$  From (i) and (ii),

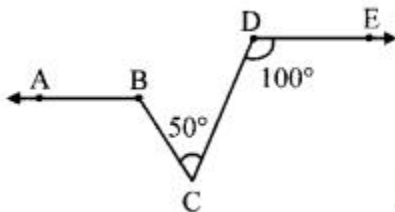
line  $l \parallel$  line  $m \parallel$  line  $n$

i.e., line  $l \parallel$  line  $n$

#### Question 4.

In the given figure, if ray  $BA \parallel$  ray  $DE$ ,  $\angle C = 50^\circ$  and  $\angle D = 100^\circ$ . Find the measure of  $\angle ABC$ .

(Hint: Draw a line passing through point C and parallel to line AB.)



#### Solution:

Draw a line FG passing through point

C and parallel to line AB

line  $FG \parallel$  ray  $BA$  .....(i) [Construction]

Ray  $BA \parallel$  ray  $DE$  ....(ii) [Given]

line  $FG \parallel$  ray  $BA \parallel$  ray  $DE$  ... (iii) [From (i) and (ii)]

line  $FG \parallel$  ray  $DE$  [From (iii)]

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and seg DC is their transversal

$$\therefore \angle DCF = \angle EDC \text{ [Alternate angles]}$$

$$\therefore \angle DCF = 100^\circ [\because \angle D = 100^\circ]$$

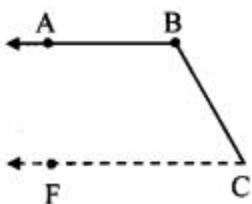
Now,  $\angle DCF = \angle BCF + \angle BCD$  [Angle addition property]

$$\therefore 100^\circ = \angle BCF + 50^\circ$$

$$\therefore 100^\circ - 50^\circ = \angle BCF$$

$$\therefore \angle BCF = 50^\circ \dots(\text{iv})$$

Now, line  $FG \parallel$  ray  $BA$  and seg  $BC$  is their transversal.



$$\therefore \angle ABC + \angle BCF = 180^\circ \text{ [Interior angles]}$$

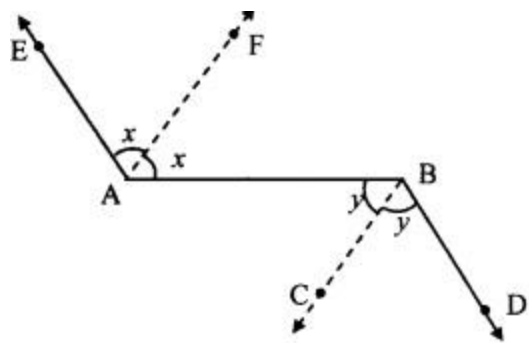
$$\therefore \angle ABC + 50^\circ = 180^\circ \text{ [From (iv)]}$$

$$\therefore \angle ABC = 180^\circ - 50^\circ$$

$$\therefore \angle ABC = 130^\circ$$

### Question 5.

In the given figure, ray  $AE \parallel$  ray  $BD$ , ray  $AF$  is the bisector of  $\angle EAB$  and ray  $BC$  is the bisector of  $\angle ABD$ . Prove that line  $AF \parallel$  line  $BC$ .



Given: Ray  $AE \parallel$  ray  $BD$ , and

ray  $AF$  and ray  $BC$  are the bisectors of  $\angle EAB$  and  $\angle ABD$  respectively.

To prove: line  $AF \parallel$  line  $BC$

**Solution:**

Proof:

Ray  $AE \parallel$  ray  $BD$  and seg  $AB$  is their transversal.

$$\therefore \angle EAB = \angle ABD \dots(i) \text{ [Alternate angles]}$$

$$\angle FAB = \frac{1}{2} \angle EAB \text{ [Ray AF bisects } \angle EAB]$$

$$\therefore 2\angle FAB = \angle EAB \dots(ii)$$

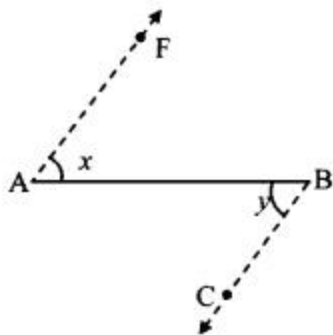
$$\angle CBA = \frac{1}{2} \angle ABD \text{ [Ray BC bisects } \angle ABD]$$

$$\therefore 2\angle CBA = \angle ABD \dots(iii)$$

$$\therefore 2\angle FAB = 2\angle CBA \text{ [From (i), (ii) and (iii)]}$$

$$\therefore \angle FAB = \angle CBA$$

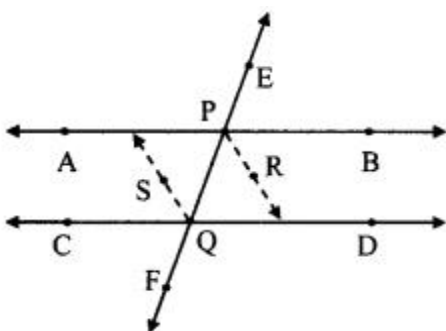
But,  $\angle FAB$  and  $\angle ABC$  are alternate angles on lines  $AF$  and  $BC$  when seg  $AB$  is the transversal.



$\therefore$  line AF  $\parallel$  line BC [Alternate angles test]

### Question 6.

A transversal EF of line AB and line CD intersects the lines at points P and Q respectively. Ray PR and ray QS are parallel and bisectors of  $\angle BPQ$  and  $\angle PQC$  respectively. Prove that line AB  $\parallel$  line CD.



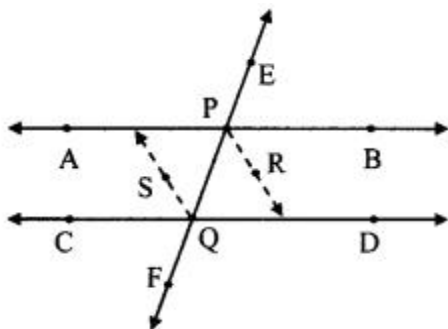
Given: Ray PR  $\parallel$  ray QS

Ray PR and ray QS are the bisectors of  $\angle BPQ$  and  $\angle PQC$  respectively.

To prove: line AB  $\parallel$  line CD

**Solution:**

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Proof:

Ray PR || ray QS and seg PQ is their transversal.

$$\angle RPQ = \angle SQP \dots (i) \text{ [Alternate angles]}$$

$$\angle RPQ = 12 \angle BPQ \dots (ii) \text{ [Ray PR bisects } \angle BPQ]$$

$$\angle SQP = 12 \angle PQC \text{ [Ray QS bisects } \angle PQC]$$

$$\therefore 12 \angle BPQ = 12 \angle PQC$$

$$\therefore \angle BPQ = \angle PQC$$

But,  $\angle BPQ$  and  $\angle PQC$  are alternate angles on lines AB and CD when line EF is the transversal.

$$\therefore \text{line AB} \parallel \text{line CD} \text{ [Alternate angles test]}$$

### Question 1.

In the given figure, how will you decide whether line  $l$  and line  $m$  are parallel or not? (Textbook pg. no. 19)



**Answer:**

In the figure, we observe that line  $l$  and line  $m$  are coplanar and do not intersect each other.

$\therefore$  Line  $l$  and line  $m$  are parallel lines.

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# Maharashtra Board Solutions

## Class 9 Maths

### Part 2

- Chapter 1.1- Basic Concepts in Geometry
- Chapter 1.2- Basic Concepts in Geometry
- Chapter 1.3- Basic Concepts in Geometry
- Chapter 2.1- Parallel Lines
- Chapter 2.2- Parallel Lines
- Chapter 3.1- Triangles
- Chapter 3.2- Triangles
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- Chapter 4.1- Constructions of Triangles
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- Chapter 8.2- Trigonometry
- Chapter 9.1- Surface Area and Volume
- Chapter 9.2- Surface Area and Volume
- Chapter 9.3- Surface Area and Volume

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The Maharashtra government established the Maharashtra State Bureau of Textbook Production and Curriculum Research, also commonly referred to as Ebalbharati, in 1967 to take up the responsibility of providing quality textbooks to students from all classes studying under the Maharashtra State Board. MSBHSE prepares and updates the curriculum to provide holistic development for students. It is designed to tackle the difficulty in understanding the concepts with simple language with simple illustrations. Every year around 10 lakh students are enrolled in schools that are affiliated with the Maharashtra State Board.

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