Class 9 triangles ncert solutions pdf

NCERT Solutions for Mathematics 9th Grade Chapter 7 Triangles provides answers and questions related to the chapter. A triangle, the word itself describes its meaning. Three means three, so a closed figure formed by three intersecting lines is known as the Triangle. Students must have already studied the angular property of the triangle in Chapter 6 of the NCERT 9 math class. Now, inconsequential to it, Chapter 7 of NCERT Grade 9 Mathematics will additionally brief students about the congruence of triangles, and the rules of congruence. They also learn a few more of the properties of triangles and inequalities in the triangle. Here we have provided the complete solution of NCERT Class 9 Mathematics Chapter 7 Triangles in PDF format solved by experienced teachers. Students can download the free PDF by clicking on the link below to keep it handy for future links. Download NCERT Solutions for Class 9 Mathematics Chapter 7 - Triangles List of Exercises in Class 9 Mathematics Chapter 7Exercise 7.1 Solution 8 Questions (6 Short Answer Questions, 2 Long Answer Question)Exercise 7.2 Solution 8 Questions (6 Short Answer Questions, 2 Long Answer Question) Exercise 7.3 Solution 5 Questions (3 Short Answers Questions, 2 Long Answers Question) Exercise 7.4 Solution 6 Questions (5 Short Answer Questions , 1 Long Answer to the question)Exercise 7.5 (optional) Solution 4 Issues Access Math Answers NCERT Class 9 Chapter 7 - Triangles Exercise: 7.1 (Page No: 118) 1. The four-way ACBD, AC and AB is a separate A (see Figure 7.16). Show me what the ABC IS. What can you say about BC and BD? Solution: Given that AC and AD are equal, i.e. AC and AD and the AB linear segment to separate A. Now we have to prove that the two ABC and ABD triangles are similar, i.e. WABK ASBD Proof: Consider the triangles of WABC and AD, (i) AC and AD (This is given in question) (ii) (III) (III) SAS congruence criterion. For the second part of the question, B.C. and BD have equal length under C.P.C.T. 2. ABCD is a four-way, in which AD and DAB and CBA (see Pic 7.17). Prove that (i) DBD bD (ii) DB - AC (iii) ABD - BAC. Solution: These parameters from the DAB and AD and B.C. i) ISSUES and the SAS are similar in congruence sas, as AB and BA (it's a common hand) DAB and AD q BC (These are given in question) Thus, the ABD and BAC triangles are similar, i.e. THE ASBDAK. (From here it's proven). (ii) It is now known that the BD DBD is so, BD th AC (by CPCT rule). (iii) Since the SBAC is so, the Angles of ABD and BAC (by CPCT rule). 3 AD and BC are equal perpendicular to the AB line segment (see Figure 7.18). Show that CD bisects AB. Solution: Given that AD and B.C. are two equal perpendicular AB. We have to prove that the CD is the bic factor of AB Now, the Triangles of THE AND THES are similar in congruence to AAS (i) A (They are perpendicular) (ii) AD (as in the matter) (iii) AOD and BOC (They are vertically opposite angles) ∴ THE ASB. So, AO and OB (according to the CPCT rule). Thus, CD bisects AB (hence proven). 4. l and m are two parallel lines intersecting with another pair of parallel lines p and q (see Figure 7.19). Show me that THE CDA. Solution: Given that p q and l m To prove: THE ABC and CDA Triangles are similar, i.e. the qABC qDA Proof: Consider THE ASA and KKDA, (i) BCA and BAC - DCA Since they are alternative internal angles (ii) AC and CA, as it is a common hand So, according to the asa congruence criterion. 5. Line L is a corner a and B bic over at L. BP and BK perpendicular from B to A (see figure 7.20). Show that: (i) ASB (ii) BP or BH or B is equal to the killer of the hands of A. Solution: Given that line l is a bicmer of angle A, and the linear segments of BP and BZ perpendicular l. (i) AAPB and ASB are similar to the congruence of AAS, because: P q (They are two right angles) (ii) cpcT, BP and BH. Thus, it can be said that point B is equal to the hands of A. 6. In rice. 7.21, AC - AE, AB - AD and BAD - EAC. Show that B.C. and DE. Solution: This is given in the matter that AB and AD, AC and AE, and ∠BAD - ∠EAC To prove: linear segment B.C. and DE similar, i.e. BC and DE Proof: We know that BAD and EAC Now adding DAC on both sides we get, BAD : i) AC and AE (as given in question) (ii) BAC and EAD (iii) AB and AD (It is also given in question) ∴ The ABC and ADE Triangles are similar, i.e. ASBK ASDE. Thus, according to the CPCT rule, we can say that B.C. and DE. 7. AB is a linear segment and P is the middle point. D and E are points on the same side of AB in the way that BAD and ABE and EPA and DPB (see Pic 7.22). Show that (i) DAP qEBP (ii) AD and BE Solutions: In question, this is given that P is the middle point of the AB segment line. Also, BAD - ABE and EPA - DPB (i) Given that EPA and DPB Now, add DPE on both sides, EPA (DPE) DPB-DPE This means that the corners of DPA and EPB are equal, i.e. DPA and EPB Now, consider the triangles DAP and EBP. DPA and EPB AP - BP (since P is the middle point of the AB line segment) BAD and ABE (as a matter of fact) thus, by the congruence of the ASA, the zDAP of the AB. (ii) CPCT, AD and BE. 8. In the right triangle of the ABC, right angle to C, M is the middle point of AB hypotenuse. C joins M and is produced in point D so that DM and CM. Point D joins point B (see Figure 7.23). Show that: (i) qAMC bpmD (ii) DBC is right-angle. (iii) DDB KAKB (iv) CM 1/2 AB Solution: Given that M is the midpoint of the AB, C and DM line segment Consider the triangles of RMD and CBMD: AM and BM (since M is the middle point) CM and DM (Given in question) CMA and DMB (They are vertically opposite angles) So, according to the SAS congruence criterion, THE SBMD. (ii) ACM and BDM (CPCT) ∴ AC BD as alternative internal angles are equal. Currently, ACB (DBC 180 (Since they are co-interiors corners) ⇒ 90 B 180 ∴ DBC - 90 (iii) in KDBC and DAKB, B.C. - CB (common side) ACB - DBC (They are at right angles) DB and AC (by CPCT) So, CB (common side) DBC (They are right angles) DB and AC (by CPCT) So, KB (common side) DBC (They are right angles) DB and AC (by CPCT) So, KB (common side) DBC (They are right angles) DB (iv) DC - AB (Since DDBK ASCB) ⇒ DM - CM - AM (since M - middle point) So, D SM - SM - SMAM FROM HERE, SM - SM - AB ⇒ SM - (1/2) AB Exercise: 7.2 (Page No: 123) 1. In the ABC Isocele Triangle, with AB and AC , B and C bisectors intersect with each other in O. Join the A to O. Show that: (i) OB OC (ii) AO splits the solution: Considering: AB and AC and two-set-sectors B and C intersect with each other on O (i) Since ABC is isocery with AB ∴ and AC, B and C 1/2 B 1/2 C ⇒ OBC ii) IN THE AND, AB AC (Given in question) AO (Common Hand) OB (as already proven) So, POA ON congruent condition SSS. BAO and CAO (by CPCT) Thus, AO splits A. 2. Ad is a perpendicular bisector BC (see Figure 7.30). Show that WABC is a triangle of isoceles in which AB and AC. Solution: Given that AD is a perpendicular bicetor BC To prove: AB and AC Proof: IN THE ASDB and AD, AD (It's a common hand) ADB and ADC BD CD (Since AD is a perpendicular bicetor) So, thus, AB NO AC (by CPCT) 3. ABC is a triangle of isosels, in which the heights of BE and CF are drawn to the equal sides of AC and AB respectively (see Figure 7.31). Show that these heights are equal. Solution: Considering: (i) BE and CF are heights. (ii) AC and AB To prove: BE - CF Proof: Triangles of ASB and WAFC are similar in congruence to AAS, as A (It's a common hand) AEB and AFC (they are right angles) AB and AC (Given in question) ∴ ZAEB ASFC and so, BE q CF (by CPCT). 4. ABC is a triangle in which the heights of BE and CF in the sides of THE SMO AND AB are equal (see Figure 7.32). Show that (i) zakf (ii) AB and AC, i.e. ABC is a triangle of isoseles. Solution: Given that BE and CF (i) in WABE and A (It's a common angle) AEB and AFC (They are the right corners) BE and CF (Given in question) ∴ THE AAS congruent terms of AAS. (ii) AB and AC from CPCT and so, ABC is a triangle isosceles. 5. ABC and DBC are two triangles of isoceles on the same base BC (see Figure 7.33). Show that ABD and ACD. Solution: In question, he gave that ABC and DBC two isosceles triangles. We'll have to show that ABD and ACD Proof: JABD and DAKD are similar in congruence to SSS, as AD and AD (It's a common hand) AB and AC (since ABC is a triangle of isocele) BD BD (Because BCD is a triangle of isoceles) ∴ ABD and ACD by CPCT. 6. WABC is a triangle of isoceles in which AB and AC. Side BA is made for D in such a way that AD and AB (see Figure 7.34). Show that BCD is right angles. Solution: This is given that AB and AC and AD AB We must now prove BCD is right angles. Proof: Consider WAB, AB and AC (This is given in question) ACB and ABC (They're angles opposite equals and so, they're equal) Now, consider THE ACT, AD AB Also, ADC and ACD (They're angles opposite equal parties and so, they're equal) Now, IN KAB - ACB - ABC - 180 So, CAB 2ACB - 180 ⇒ CAB - 180 - 2ACB - , in CADK, CAD - 180 - 2ACD - (ii) also, CAB and CAD 180 (BD is a straight line.) Adding (i) and (ii) we get, CAB and CAD - 180 - 2ACB -180 - 2ACD ⇒ 180 - 360 ⇒ - 2ACB-2ACD ⇒ 2 (ACB-ACD) ABC - is a triangle with a right angle in which A and AB - AB . Find the solution B and C. In question, given that A - 90 and AB - AC AB - AC ⇒ B - C (they are angles opposite to equal sides, and so, they are equal) Now, ASPC 180 (from the moment of the sum of the inner corners ⇒ triangle) ∴ 9 ⇒0 , B and C 45 8. Show that the angles of the equilateral triangle are 60 degrees each. Solution: Let the ABC be an equilateral triangle, as shown below: Here, B.C., AC and AB (Because the length of all sides is the same) ⇒ A and B q C (Parties opposite equal angles are equal.) In addition, we know that the ASPC ⇒ 3A and 180 ⇒ A 60 ∴ A - B - 60, so that the angles of the 60-plus triangle are always 60 each. Exercise: 7.3 (Page No: 128) 1. THE UBC and DDBC are two triangles of isoceles on the same base bc, and the A and D verticals are on one side of B.C. (see Figure 7.39). If the AD extends to the B.C. to P, show that (i) THE ASAD (ii) AP (iii) AP corrodes A, and D. (iv) AP is a perpendicular bisector B.C.: In the above question, it's taking into account that the A.C.A. and the B.C. i) ABD and DAKD are similar in congruence to SSS because: AD and AD (It's a common hand) AB and AC (since zABC isosceles) BD and CD (Since HDBC is isoceles) ∴ ADBD (ii) AB and ACBP are similar to: AP and AP (it's a common side) PAB and PAC (by CPCT since the ACT) AB and AC (since THEBK is isicals) So, SASA' CONGRU. (iii) PAB and PAC from CPCT as ADBD ASHAD. AP bisects A. - (i) In addition, CBPD and efficiency are similar to SSS congruence, as PD PD (This is the common side) BD and CD (since CDBC isosceles.) BP and CP (by CPCT as a SLA) thus, the PDLP efficiency. Thus, BDP and CDP from CPCT. - (ii) Now, comparing (i) and (ii) can be said that THE corrodes A, as well as D. (iv) BPD and CPD (by CPCT as efficiency efficiency) and BP - CP - (i) also, BPD (CPD) 180 (Since BC is. lines.) ⇒ 2BPD and 180 ⇒ BPD - 90 -(ii) Now, from equations (i) and (ii), we can say that THE is a perpendicular bic factor BC 2. AD is the height of the ABC isocelel triangle in which AB and AC. Show that (i) AD bisects bc (ii) AD bisects A. Solution: Given that AD is height and AB q AC. The diagram is as follows: (i) IN THEABD and DAKD, ADB and ADC - 90 AB (This is given in question) AD (Common Hand) ∴ ASBD DAKD as a congruence of RHS. Now, according to the CPCT, BD and CD rules. Thus, AD bisects BC (ii) Again, by the rule of CPCT, BAD and CAD hence, AD bisects A. 3. The two sides of AB and BC and the average AM of one ABC triangle are respectively equal to the parties of the CP and CD and the median PN OF the EPR (see Figure 7.40). Show that: (i) ABM (II) ABK PDR Solution: Considering the parameters: AB th PH, BK yr and AM (i) 1/2 BC and 1/2 CD BN (since AM and PN are medians) Also, BC - 1/2 BC - 1/2 OF ⇒ BM - N B-PD and SPN, AM - PN and AB -EP (as indicated in question) BM BN (already proven) ∴ of the ABMPC on the congruence of the NHS. (ii) In the ABC and the APD, AB and BK y R (as in question) ABC and PDR (by CPCT) So, SABC OF THE SAS on THE UNCGRUence SAS. 4. BE and CF are two equal heights of the ABC triangle. Using the RHS congruence rule, prove that the ABC triangle is isosceles. . Solution: IT is known that BE and CF are two equal heights. Now, in THE IB AND KFB, BEC and CFB (same heights) BC Also, C q B (by CPCT) Thus, AB q AC as parties opposite to equal angles, are always equal. 5. ABC isosceles triangle with AB and AC. Draw AP ⊥ B.C. to show that B and C. Solution: In question, it's given that AB and AC Now, AB and DAPP are similar in congruence to RHS, like APB and APC (AP Height) AB ∴ B and C (by CPCT) Exercise: 7.4 (Page: 132) 1. Show that in the triangle with the right angle the hypotenus is the longest side. Solution: It is known that ABC is a triangle at a B angle. Since A is the largest angle of the triangle, the side opposite it should be the largest. Thus, AB is the hypotenuse that will be the largest side of the aforementioned right-angle triangle, i.e. THE ABC. 2. In rice. 7.48 AB and UC BBC are extended to P and q points respectively. In addition, PBC zlt; KKB. Show that AB. Solution: This is considering that PBC's qlt; KKB We know that ABC and PBC - 180 So, ABC - 180-PBC Also, ACB KKB 180 So ACB 180 - KKB Now, since PBC's LT; KKB, ∴ ABC's aCB hence, AC's as a side opposite the corner is always bigger. 3. In rice. 7.49, B and C and C. Show that AD qlt; B.C. Solution: In question, mentions that the B angles and the C angle are less than the corners D, i.e. B and C and C, now, since the side opposite the smaller angle is always smaller than AO zlt; BO - (i) AND OD qlt; OC -(ii) Adding the equation (i) and the equation (ii) we get the AO-OD qlt; BO and OC So, AD and LT. AB and CD, respectively, are the smallest and longest sides of the quadrilateral ABCD (see Pic 7.50). Show that the C and B'gt; D. Solution: In the ADBD, we see that AB qlt; AD. So, ADB and ABD - (i) (since the angle opposite the longer side is always greater) Now, in the CBD, B.C., B.C. qlt; BD Therefore, it can be concluded that BDC qlt; CBD - (ii) Now, adding the equation (i) and the equation (ii) we receive, and the ADB BDC , In the ABC Triangle, ACB zlt; BAC - (iii) (since the angle opposite the longer side, always more) Now, in the ABC, DCA zlt; DAC - (iv) Adding equation (iii) and equation (iv) we get, ACB and DCA zlt; BAC-DAC ⇒ BCD qlt and BAD ∴ In rice. 7.51, PR and PS Prove that PSR is a solution: Given that PR zgt; PL and PS bisects CRC Now we will have to prove that the PSR angle is smaller than PSR, ie. PSR's PS' Proof: PS - RPS - (ii) (Like PS bisects ∠PR) PRp qgt; PR - (i) (WITH PR's p, as the angle opposite the big side is always more) PSR - PPR - PS - (iii) (Since the outer angle angle equals the sum of opposite inner corners) PS ' (i) and (ii) EPR (PS) PR, therefore, from (i), (ii), (iii) and (iv), we get PSR zgt; PS 6. Show that of all the linear segments taken from this point not on it, the perpendicular segment of the line is the shortest. Let C be any other point on L. Chart will be as follows: To prove: AB zlt; AC Proof: In WABK, B and 90 Now, we know that the ABCK 180 ∴ A.S. 90 Thus, C should be a sharp angle, which implies the C q lt; B So, AB qlt; AC (as the side opposite the corner is always more) The Triangle is part of the geometry. However, the full geometry of Class 9 is the weight of 22 marks out of 80 marks. Take a look at the types of questions that are expected from geometry in the annual Grade 9 Mathematics paper exam. NCERT Class 9 Geometry Mathematics - Signs Distribution Topics Multiple Issues Choice Short Issues Long Issues Introduction to Euclid Geometry, Lines and Corners, Triangles, Four-way, Areas, Circles, Designs 4's 1 Mark Every 2 of 3 Marks Each 2 of 6 Marks Each Total Marks 4 Marks 6 Marks 12 Signs Students must practice all questions from exercise. Step-by-step solution for all NCERT Class 9 exercises 7 below: In previous classes, students must use the properties of triangle triangles solution issues, but now in NCERT Chapter 7 grade 9, Math students will learn to prove these properties. In order to address the issues related to this topic, it is very necessary that the student knows the rule of congruence. So, first go through the theory, and then look at the solved examples that are already in the book. Then start solving problems with exercise. Students can also take a look at NCERT Class 9 Solutions for Science provided to know the answers to all chapters with a detailed explanation. Important concepts explored in NCERT Class 9 Mathematics Chapter 7 - Triangles The purpose of incorporating this chapter triangle into the grade 9 Mathematics NCERT tutorial is to let students know the following concepts: Congruence of triangles. Triangle congruence criteria (SAS congruence rule, ASA congruence rule, SSS congruence rule, RHS congruence rule). Triangle properties. Triangle inequality. We hope this information on NCERT Solution Class 9 Mathematics Chapter 7 is useful for students. Click on NCERT solutions to get ncERT responses for all classes. Stay tuned for further updates on CBSE and other competitive exams. To access the interactive Math and Science Videos download BYJU'S App and subscribe to the YouTube channel. Channel. maths class 9 triangles ncert solutions. ncert solutions class 9 maths areas of parallelograms and triangles. ncert solutions for class 9 maths triangles exercise 7.1. ncert solutions for class 9 maths triangles exercise 7.2. ncert exemplar class 9 maths solutions triangles. ncert solutions class 9 maths areas of parallelograms and triangles exercise 9.3. ncert solutions for class 9 maths triangles exercise 7.4. ncert solutions for class 9 maths triangles exercise 7.3