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|  | TEACHER’S ACTIVITY | STUDENT’S ACTIVITY |
| THEME | Deductive Proofs |  |
| CLASS | SS1 |  |
| DATE | Monday 22nd April, 2024 |  |
| SUBJECT | Mathematics |  |
| MODE | Entire Class |  |
| TIME | 8.40am – 9.20am |  |
| PERIOD | 1st |  |
| DURATION | 40 Minutes |  |
| UNIT LESSON | Types and properties of triangles |  |
| LESSON TOPIC | Deductive proofs I |  |
| SPECIFIC OBJECTIVES | At the end of this lesson, students should be able to:   1. Define a triangle; 2. Name and identify each triangle type; 3. State the properties of each type of triangle; |  |
| INSTRUCTIONAL RESOURCES | Cardboard paper, cut-out of triangles, protractor. |  |
| PRESENTATION | The teacher presents the topic with the aid of these steps. |  |
| STEP 1 | **IDENTIFICATION OF PRIOR IDEA** |  |
|  | The teacher asks the students to briefly describe a triangle. | The students answer the question. |
| STEP 2 | **EXPLORATION** |  |
|  | The teacher explores by sketching a triangle and tasking the students to name its parts. | The students answer the question. |
| STEP 3 | **DISCUSSION** |  |
|  | **Triangle**  A triangle is a plane figure with three straight sides and three angles. It is also a three-sided polygon that has three angles, vertices, and sides.    **Types of triangles**  There are different types of triangles in math that can be distinguished based on their sides and angles.  The characteristics of a triangle’s sides and angles are used to classify them.  *Based on sides and angles*   1. **Equilateral triangle:** A triangle with all three sides and angles equal. 2. **Isosceles triangle:** A triangle with two sides and two base angles equal. 3. **Scalene triangle:** A triangle with neither of the sides nor the angles equal. 4. **Right angle triangle**   Hypotenuse  Opposite  Adjacent  A right-angled triangle is a triangle that has one of its interior angles equal to 900.  **Pythagoras theorem**  In a right-angled triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.  Hyp2 Opp2 Adj2 | The students listen to the teacher and copy the note. |
| STEP 4 | **APPLICATION** |  |
|  | Example 1  Given a right-angled *ABC* at *A* and 2. Prove that 5.  Solution  C  A  B  2 (*given*)  By Pythagoras theorem, is the hypotenuse.      4  5 (*proved*)  Example 2  *ABC* is an isosceles triangle in which 5 *cm* and 6 *cm*. Calculate , where *M* is the midpoint of .  Solution  Since *M* is the midpoint of then it follows that 3 *cm*.  By Pythagoras theorem:    52 32  25 9  16  4 *cm* (Ans) | The students listen to the teacher and ask questions. |
| STEP 5 | **EVALUATION** |  |
|  | The teacher evaluates the lesson with the questions below:   1. Define a triangle with examples. 2. The diagonals of a rhombus measure 8 *cm* and 6 *cm*. What is the length of a side of the rhombus? | The students answer the questions. |
| CONCLUSION | The teacher concludes the lesson by giving correction to the evaluation question. |  |
| ASSIGNMENT | Exercise 13.3, pg. 163, question 9 |  |
| REFERENCE | New Concept Mathematics for senior secondary school book 1 by H N Odogwu, et al. |  |

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|  | TEACHER’S ACTIVITY | STUDENT’S ACTIVITY |
| THEME | Geometry |  |
| CLASS | SS1 |  |
| DATE | Tuesday 23rd April, 2024 |  |
| SUBJECT | Mathematics |  |
| MODE | Entire Class |  |
| TIME | 8.00am – 8.40am |  |
| PERIOD | 1st |  |
| DURATION | 40 Minutes |  |
| UNIT LESSON | Proof of sum of angles in a triangle is 1800 |  |
| LESSON TOPIC | Deductive proofs I |  |
| SPECIFIC OBJECTIVES | At the end of this lesson, students should be able to:   1. Explain the format for carrying out proofs in geometry; 2. Prove that the sum of angles in a triangle is 1800; 3. Solve problems involving the sum of angles in a triangle. |  |
| INSTRUCTIONAL RESOURCES | Cardboard paper, cut-out of triangles, and protractor. |  |
| PRESENTATION | The teacher presents the topic with the aid of these steps. |  |
| STEP 1 | **IDENTIFICATION OF PRIOR IDEA** |  |
|  | The teacher asks the students to state what angles are formed on opposite sides of a transversal drawn across two parallel lines. | The students answer the question. |
| STEP 2 | **EXPLORATION** |  |
|  | The teacher explores by drawing a transversal across two parallel lines and asks the students to identify the alternate angles. | The students identify the alternate angles. |
| STEP 3 | **DISCUSSION** |  |
|  | **The sum of angles in a triangle is 1800**  *Given*: *PQR*  *To prove*:  1800  *Construction:* Produce *QR* to point *T* and draw parallel to .  *Proof:* Since  *q*1 *q*2 (*Corresponding angles*)  *p*1 *p*2 (*Alternate angles*)  *r* *p*2 *q*2 1800 (*QT* *is an angle on straight line*)  Hence, *r* *p*1 *q*1 1800 (*since p*1 *p*2 and *q*1 *q*2)  Then,  *PQ* 1800  1800 | The students listen to the teacher and copy the note. |
| STEP 4 | **APPLICATION** |  |
|  | Example 1  The angles of a triangle are *x*0, (*x* – 10)0 and 900. Find the angles of the triangle and name the triangle type.  Solution  *x*0 (*x* – 10)0 900 1800 (*Sum of angles in a triangle*)  2*x*0 800 1800  2*x*0 1000  *x* 500 (Ans)  The angles of the triangle are 500, 400 and 900, thus it is a right-angle scalene triangle.  Example 2  What is the value of the angle marked *m*?  Solution  *Construction*: join point X to point Z and label the angles accordingly.  In *XYZ*,  1800 (*Sum of angles in a triangle*)  330 *p* 900 220 *q* 1800 - - (i)  In *XCZ*, *p* *q* *m* 1800 - - (ii)  Equating (i) and (ii) we have  330 *p* 900 220 *q* *p* *q* *m*  Collecting like terms  330 *p*  *p* 900 220 *q*  *q* *m*  *m* 330 900 220  *m* 1450 (Ans) | The students listen to the teacher and ask questions. |
| STEP 5 | **EVALUATION** |  |
|  | The teacher evaluates the lesson with the question below:   1. Explain the format for carrying out proofs in geometry. 2. A *PXY* is such that X is produced to *W* and *Y* is produced to *Z*. *WP* 1150 and *ZP* 1580, calculate *XY*. | The students solve the problem. |
| CONCLUSION | The teacher concludes the lesson by giving correction to the evaluation question. |  |
| ASSIGNMENT | Exercise 13.1, pg. 159, questions 4 and 8. |  |
| REFERENCE | New Concept Mathematics for senior secondary school book 1 by H N Odogwu, et al. |  |

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|  | TEACHER’S ACTIVITY | STUDENT’S ACTIVITY |
| THEME | Geometry |  |
| CLASS | SS1 |  |
| DATE | Thursday 25th April, 2024 |  |
| SUBJECT | Mathematics |  |
| MODE | Entire Class |  |
| TIME | 8.00am – 8.40am |  |
| PERIOD | 1st |  |
| DURATION | 40 Minutes |  |
| UNIT LESSON | Proof of the exterior angle of a triangle is equal to the sum of the opposite interior angles. |  |
| LESSON TOPIC | Deductive Proofs I |  |
| SPECIFIC OBJECTIVES | At the end of this lesson, students should be able to:   1. Identify the opposite interior angles whose sum equals the exterior angle; 2. Prove that the exterior angle of a triangle is equal to the sum of the opposite interior angles; 3. Solve problems involving this theorem. |  |
| INSTRUCTIONAL RESOURCES | Cardboard paper, cut-out of triangles, and protractor. |  |
| PRESENTATION | The teacher presents the topic through the following steps. |  |
| STEP 1 | **IDENTIFICATION OF PRIOR IDEA** |  |
|  | The teacher asks the students to briefly explain what they understand by interior and exterior angles of a triangle. | The students briefly explain. |
| STEP 2 | **EXPLORATION** |  |
|  | The teacher explores by sketching a triangle and producing two ends and tasks the students to identify the opposite interior angles as well as the exterior angle. | The students answer the question. |
| STEP 3 | **DISCUSSION** |  |
|  | **The exterior angle of a triangle is equal to the sum of the opposite interior angles**  *Given*: *ABC* with produced to *T*.  *To prove*: *AT*  *Proof*: *AT* *AB* 1800 (*BCT* *is angle on a straight line*)  *AT* 1800 *AB*  *AB* 1800 (*Sum of angle in a* )  Hence, 1800 *AB*  *AT* | The students listen to the teacher and copy the note. |
| STEP 4 | **APPLICATION** |  |
|  | Example 1  In the figure below, *AP* 1100 and *PD* 1630. Calculate *BC*.  0  0  Solution  *AP* + *PC* 1800 (*Angles on a straight line*)  *PC* 1800 1100  *PC* 700  *PC* + *BC* *PD* (*Exterior angle of a* )  700 + *BC* 1630  *BC* 1630 700  *BC* 930 (Ans)  Example 2  Find the size of each marked angle in the figure below.  0  0  0  0  0  0  Solution  *d* 650 (*Corresponding angles*)  *d* + *f* 1320 (*Exterior angle of a* )  650 + *f* 1320  *f* 1320 – 650  *f* 670  *f* + *g* + 650 1800 (*Angles on a straight line*)  *g* 1800 (650 + 670)  1800 1320  *g* 480  *g* *e* (*Alternate angles*)  *e* 480 | The students listen to the teacher and ask questions. |
| STEP 5 | **EVALUATION** |  |
|  | The teacher evaluates the lesson with the question below:  Name the exterior angles shown in the figure below and find the size of each exterior angle.  0  0 | The students solve the problem. |
| CONCLUSION | The teacher concludes the lesson by giving correction to the evaluation question. |  |
| ASSIGNMENT | Exercise 13.2, pg. 161, questions 3*(b)* and 3*(c)* |  |
| REFERENCE | New Concept Mathematics for senior secondary school book 2 by H N Odogwu, et al. |  |

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