**LEARNING ACTIVITY SHEET IN MATH 9**

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| Name of Learner: | **JOHN MARK E. ANTIPUESTO** | Score: |  |
| Grade and Section: | **GRADE 9 - TAE** | Week & Date: | **Week 2 – April 8, 2021** |

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| **Title of the Topic:** | **Quadrilaterals** | | |
| **Most Essential Learning Competency:** | | **Code:** | **M9GE-IIIa-2**  **M9GE-IIIc-1** |
| * Determines the conditions that make a quadrilateral a parallelogram. * Proves theorems on the different kinds of parallelogram (rectangle, rhombus, square). | | | |
| **I. Concept Notes:** *(Will be in a separate file.)* | | | |
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| **II. Learning Activities:** | | | |
| Learning Activity 1: (15 points)  **1A. Directions:** For each given set of conditions, determine whether the quadrilateral ABCD is a parallelogram. State yes or no. Then explain.    **YES**, because the **Definition of Parallelogram** states that *opposite sides of a parallelogram are parallel.* Since all conditions have been met, we can say that it is a Parallelogram.  **NO**, DC is not congruent to AD. In a parallelogram, opposite sides are congruent, but DC is not the opposite of AD. is definitely congruent to because of a theorem called Alternate Interior Angles Theorem. This theorem states that the alternate interior angles are congruent when the transversal intersects two parallel lines.  **NO**, this is not a parallelogram. BC is definitely congruent to AD via Definition of Parallelogram, but is for sure not congruent to because of the diagonals.  **YES**, is definitely true via Alternate Interior Angle Theorem. Since Alternate Interior Angles are congruent, then they must have the same angle measurement.    **YES**, In a parallelogram, diagonals bisect each other. Since they bisect, we can say that AE = CE (7.5), and BE = DE (9.5). We can say that BD = BD (19), and AC = AC (15).  **1B. Directions:** Complete the table by putting a check mark (✓) or a cross () on the appropriate spaces.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | Parallelogram | Rectangle | Rhombus | Square | | 1. Opposite sides are parallel. | ✓ | ✓ | ✓ | ✓ | | 2. diagonals form congruent triangles. | ✓ | ✓ | ✓ | ✓ | | 3. diagonal are perpendicular. | x | x | ✓ | ✓ | | 4. all angles are right angles. | x | ✓ | x | ✓ | | 5. all sides are congruent | x | x | ✓ | ✓ | | 6. diagonals are perpendicular | x | x | ✓ | ✓ |   **1C. Directions:** Do what is asked.   1. Find the measures of each numbered angle.     **ANSWERS:**   * **34°** * **56°** * **56°** * **34°** * **56°**  1. Find the value of x that makes the parallelogram the given type.     **ANSWER:**  **x = 6.75**      **ANSWER:**  **QRT is equal to 45°** | | | |
| Learning Activity 2: (25 points)  **2A. Directions:** Construct a two-column proof for each of the following.   1. Given: WHAT and WHEN are parallelograms   Prove:     |  |  |  |  | | --- | --- | --- | --- | | STATEMENTS | | REASONS | | | 1 | ▱WHAT & ▱WHEN are parallelograms | **1** | Given | | 2 |  | **2** | Opposite sides of a parallelogram are congruent | | 3 |  | **3** | Opposite sides of a parallelogram are congruent | | 4 |  | **4** | Transitive Property of Equality |  1. Given: MNOP and PQRS are parallelograms   Prove:     |  |  |  |  | | --- | --- | --- | --- | | STATEMENTS | | REASONS | | | 1 | ▱MNOP & ▱PQRS are parallelograms | 1 | Given | | 2 |  | 2 | Opposite angles of a parallelogram are congruent | | 3 |  | 3 | Opposite angles of a parallelogram are congruent | | 4 |  | 4 | Transitive Property of Equality |  1. Prove: Theorem: If both pairs of opposite sides of a quadrilateral are congruent then the quadrilateral is a parallelogram.   **Given: Prove:** ABCD is a parallelogram       |  |  |  |  | | --- | --- | --- | --- | | STATEMENTS | | REASONS | | | 1 |  | 1 | Given | | 2 |  | 2 | Reflexive Property | | 3 |  | 3 | Side-Side-Side Congruence Postulate | | 4 |  | 4 |  | | 5 |  | 5 | If two lines are cut by a transversal and alternate interior angles are congruent, then the lines are parallel. | | 6 |  | 6 | Definition of parallelogram |  1. Prove: Theorem: If a parallelogram has diagonals bisecting the angles, it is a rhombus.      |  |  |  |  | | --- | --- | --- | --- | | STATEMENTS | | REASONS | | | 1 |  | **1** | Given | | 2 |  | **2** | An angle bisector is a ray in the interior of the angle forming 2 congruent angles. | | 3 |  | **3** | Each diagonal of a parallelogram divides the parallelogram into two congruent triangles. | | 4 |  | **4** | CPCTC | | 5 |  | **5** | Transitive Property of Equality | | 6 |  | **6** | If two angles of a triangle are congruent, then sides opposite those angles are congruent. | | 7 |  | **7** | Transitive Property of Equality | | 8 | Rhombus ABCD | **8** | A rhombus is a parallelogram with four congruent sides. |  1. Given: LMNO.   Prove: LQNP is a parallelogram     |  |  | | --- | --- | | STATEMENT | REASON | | 1. LMNO | Given | | 2. | Given | | 3. LM = ON; LO = MN | **1, Property of a parallelogram** | | 4. | 1, Property of a parallelogram | | 5. | **ASA** | | 6. | 5, CPCTC | | 7. LM = LQ + QM  NO = OP+ PN | 7, If points A, B, and C are collinear such that B is between A and C, then  AB+BC=AC | | 8. LQ = LM - QM  PN = NO - OP | **SPE** | | 9. PN = LM - QM | 3,7, Substitution | | 10. LQ = PN | **TPE** | | 11. LQNP is a parallelogram | 6, 10, If both pairs of opposite sides of a quadrilateral are congruent then the quadrilateral is a parallelogram. | | | | |
| **III. Reflection:** | | | |
| I definitely still have struggles while answering this LAS. I certainly had difficulties proving that a parallelogram is a parallelogram. I am completely aware of all the steps in proving, but somehow, I am still puzzled by it and I don’t really know why. Despite that, I will continue to study and watch videos in order for me to completely understand the lesson. | | | |

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