**MATHEMATICS 2022**

**GRADE 7 PROJECT**

**TERM 3**

**MARKS: 50 TIME: 3 DAYS**

|  |  |
| --- | --- |
| **CIRCUIT** |  |
| **SCHOOL NAME** |  |
| **CLASS (e.g. 6 A)** |  |
| **NAME & SURNAME** |  |

|  |  |
| --- | --- |
| BOY | GIRL |

**GENDER** ( **DATE OF BIRTH**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| y | y | y | y | m | m | d | d |

**Instructions to learners:**

1. Read all instructions carefully.
2. Answer Questions the spaces or frames provided.
3. Show all working (where necessary).
4. The use of calculators is not allowed.
5. Write neatly and legibly.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **QUESTION 1 – GEOMETRY OF 2D** |  |
|  |  |  |  |
| **1.1** |  | **Use the following triangles to answer the questions that follow:** | **[6]** |
|  |  |  |  |
|  |  | **Triangle A** **Triangle B** **Triangle C** |  |
|  |  |  |  |
|  | 1.1.1 | Which triangle has only two sides equal? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | (1) |
|  |  |  |  |
|  | 1.1.2 | What is this type of triangle called? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | (1) |
|  |  |  |  |
|  | 1.1.3 | Which triangle has no sides equal? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | (1) |
|  |  |  |  |
|  | 1.1.4 | What is this type of triangle called? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | (1) |
|  |  |  |  |
|  | 1.1.5 | Which triangle has an angle equal to 90°? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | (1) |
|  |  |  |  |
|  | 1.1.6 | What is this type of triangle called? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | (1) |
|  |  |  |  |
| **1.2** |  | **Answer the following questions referring to the diagram below.** | **[3]** |
|  |  | B  C  D  A |  |
|  | 1.2.1 | What type of quadrilateral is ABCD? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | (1) |
|  |  |  |  |
|  | 1.2.2 | Name a side equal to AB \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | (1) |
|  |  |  |  |
|  | 1.2.3 | What is the length of BC? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | (1) |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| **1.3** |  | **Look at the following figures and answer the questions below:** | **[4]** |
|  |  |  |  |
|  |  | |  |  |  | | --- | --- | --- | | **GROUP A** | **GROUP B** | **GROUP C** | |  |  |  | |  |
|  |  |  |  |
|  | 1.3.1 | Which group has a pair of similar 2D shapes? Provide a reason for your answer. | (2) |
|  |  |  |  |
|  |  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
|  |  |  |  |
|  | 1.3.2 | Which group has a pair of congruent 2D shapes? Provide a reason for your answer. | (2) |
|  |  |  |  |
|  |  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
|  |  |  |  |
|  |  | **QUESTION 2 – GEOMETRY OF STRAIGTH LINES** |  |
|  |  |  |  |
| **2.1** |  | **Identify and name the lines in the figure below.** | **[3]** |
|  |  |  |  |
|  |  | F  E  O  G  D  A  C  B |  |
|  | 2.1.1 | Ray \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | (1) |
|  |  |  |  |
|  | 2.1.2 | Line segment \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | (1) |
|  |  |  |  |
|  | 2.1.3 | Straight line \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | (1) |
|  |  |  |  |
|  |  |  |  |
| **2.2** |  | **Study the diagram below and answer the questions that follow** | **[11]** |
|  |  |  |  |
|  |  | **A**  **C**  **B**  **D**  **E** |  |
|  |  |  |  |
|  | 2.2.1 | Identify and name **two pairs** of parallel lines in the diagram above | (2) |
|  |  |  |  |
|  |  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
|  |  |  |  |
|  | 2.2.2 | Identify and name **two pairs** of perpendicular lines in the diagram above | (2) |
|  |  |  |  |
|  |  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
|  |  |  |  |
|  | 2.2.3 | Angle ABD is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ angle. | (1) |
|  |  |  |  |
|  | 2.2.4 | What is the size of angle ABD? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | (1) |
|  |  |  |  |
|  | 2.2.5 | What type of a quadrilateral is ABDC? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | (1) |
|  |  |  |  |
|  | 2.2.6 | Give the name of quadrilateral ABEC. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | (1) |
|  |  |  |  |
|  | 2.2.7 | How many lines of symmetry does polygon ABDC has? | (1) |
|  |  |  |  |
|  |  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
|  |  |  |  |
|  | 2.2.8 | What type of a triangle is triangle BDE? | (1) |
|  |  |  |  |
|  |  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
|  | 2.2.9 | What type of angle is angle E? | (1) |
|  |  |  |  |
|  |  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
|  |  |  |  |
| **2.3** |  | **G is the centre and A, G and C lie on the same straight line.** | **[9]** |
|  |  |  |  |
|  |  | G  A  B  C |  |
|  | 2.3.1 | Draw line segments GA, GB and GC. | (3) |
|  |  |  |  |
|  | 2.3.2 | What do we call line segments GA, GB and GC? | (1) |
|  |  |  |  |
|  |  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
|  |  |  |  |
|  | 2.3.3 | Draw a line segment that joins point A to point C. | (1) |
|  |  |  |  |
|  | 2.3.4 | What do we call line segment that joins point A to point C? | (1) |
|  |  |  |  |
|  |  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
|  |  |  |  |
|  | 2.3.5 | Draw line segments that join point A to point B and point B to point C | (2) |
|  |  |  |  |
|  | 2.3.6 | What do we call line segment A to B and B to C? | (1) |
|  |  |  |  |
|  |  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
|  |  |  |  |
|  |  | **QUESTION 3 - TRANSFORMATION GEOMETRY** |  |
|  |  |  |  |
| **3.1** |  | **Look at the following triangles and answer the questions that following.** | **[8]** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  | **How many times is:** |  |
|  | 3.1.1 | FG longer than BC? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | (1) |
|  |  |  |  |
|  | 3.1.2 | JK shorter than BC? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | (1) |
|  |  |  |  |
|  | 3.1.3 | EF longer than AB? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | (1) |
|  |  |  |  |
|  | 3.1.4 | IJ shorter than AB? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | (1) |
|  |  |  |  |
|  | 3.1.5 | Is ΔEFG an enlargement of ΔABC? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | (2) |
|  |  | Explain your answer. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
|  |  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
|  |  |  |  |
|  | 3.1.6 | Is ΔIJK a reduction of ΔABC? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Explain your answer. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | (2) |
|  |  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
|  |  |  |  |
|  |  |  |  |
| **3.2** |  | **Look at the diagrams below and answer the questions based on each diagramme.** | **[6]** |
|  |  |  |  |
|  | 3.2.1 | Reflect this parallelogram in the vertical mirror line |  |
|  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | (2) |
|  |  |  |  |
|  | 3.2.2 | On a grid rotate line PA anti-clockwise through 90° about P. Label the rotated line. | (2) |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  | 3.2.3 | The triangle ABC has been translated into triangle A’B’C’ on a grid.  Describe the transformation that has taken place below | (2) |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
|  |  |  |  |
|  |  |  |  |

**TOTAL MARKS: 50**