**GRADE 8 MATHEMATICS**

**TERM 2**

**FORMAL ASSESSMENT TASK INVESTIGATION: Constructions and Properties of Triangles**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Class: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

School: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Teacher:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Total: 80 Marks Time: 1½ hour**

**Instructions:**

1. Write your name and surname in the spaces above.
2. All questions must be answered on the question paper.
3. Show all calculations.
4. You may use an approved calculator.
5. In this Investigation you will use a pencil, ruler, protractor and a compass.
6. You must do your own work.
7. Check your answers.
8. Show the units of measurement where applicable.
9. All answers must be rounded to one decimal place unless stated otherwise.

**Section A: INVESTIGATION [50]**

1. Use a ruler and a protractor to draw the following angles:

|  |  |  |
| --- | --- | --- |
| 1.1 | 30o |  |
| 1.2 | 90o |  |
| 1.3 | 60o |  |
| 1.4 | 75o |  |
| 1.5 | 135 o |  |

[5]

**Question 2:** Use ONLY a ruler and a compass to draw the following angles. (Do not erase your construction lines):

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Angle**  **(in degrees)** | **Construction** | **Description of construction** |
| 2.1 | 30o |  |  |
| 2.2 | 90o |  |  |
| 2.3 | 60o |  |  |
| 2.4 | 75o |  |  |
| 2.5 | 135 o |  |  |

[15]

* 1. In the sketch below ABC is not drawn to scale. Construct ABC next to its rough sketch below.

**A**

**5cm**

**5cm**

**5cm**

**C**

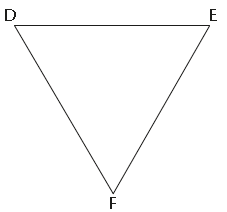
**B**

(2)

* 1. Measure and label the sizes of all the sides and angles on the construction. Complete the table below:

|  |  |
| --- | --- |
| **Angle** | **Degrees** |
| A |  |
| B |  |
| C |  |

(3)

* 1.  Measure and write down the sizes of the sides and angles of DEF on the right

|  |  |
| --- | --- |
| **Angle** | **Degrees** |
| D |  |
| E |  |
| F |  |
| **Side** | **Length in mm** |
| DE |  |
| EF |  |
| FD |  |

(6)

* 1. Make a comment on the triangles in 3.1 and 3.3 with regard to:
     1. the sides:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
     2. the angles: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
     3. the type of triangle (using the above characteristics): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(3)

[14]

4.1 Construct the following triangles:

4.1.1 DEF with EF = 7cm, and

(3)

4.1.2 JKL with JK = 6cm, KL = 6cm and .

(3)

4.2 Measure and label all the sides and angles of each triangle in 4.1 and complete the tables

below:

|  |  |
| --- | --- |
| **Angle** | **Degrees** |
| K |  |
| L |  |
| **Side** | **Length in mm** |
| LJ |  |

|  |  |
| --- | --- |
| **Angle** | **Degrees** |
| D |  |
| **Side** | **Length in mm** |
| DE |  |
| FD |  |

(6)

* 1. Make a comment on the triangles in 4.1 with regard to :
     1. the sides: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
     2. the angles: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4.3.3 the type of triangle (using the above characteristics): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (3)

4.4 Look at your constructed triangles ABC, DEF and JKL in the previous questions. What is the sum of the interior angles of the three triangles each time? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(1)

[16]

**Section B: ASSIGNMENT [30]**

5. In ABC , AB = 5cm, BC = 3cm and AC = 4cm.

5.1 Construct ABC. Do not erase any construction arcs and lines. (3)

5.2 Measure the size of . (1)

5.3 What type of triangle is ABC? (1)

5.4 Bisect , and . Show your construction lines on ABC (3)

5.5 Label the point of intersection(point where lines intersect) of the angle bisectors **O**.

Use **O** to draw the inscribed circle of ABC. (2)

5.1

5.2 C = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5.3 ABC is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ triangle. **[10]**

6.1 Is the following statement TRUE or FALSE: All equilateral triangles, no matter what size they are, have angles that are equal to 60. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1)

6.2 In a triangle, two of the angles are 35 and 63 respectively. Calculate the third angle.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(1)

6.3 Write down the definitions of the triangles in the table below:

|  |  |  |
| --- | --- | --- |
| Equilateral triangle | Isosceles triangle | Right-angled triangle |
|  |  |  |

(5)

6.4 Determine the size of . Show all your steps and give reasons for your statement(s):

**T**

**V**

**U**

**25**

**3*x* + 5**

**2*x***

(4)

|  |  |
| --- | --- |
| **Statement** | **Reason** |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

6.5 Calculate the size of *a* and *b* respectively in the diagram below:

**35**

***a***

***b***

**60**

**A**

**B**

**C**

**D**

(4)

|  |  |
| --- | --- |
| **Statement** | **Reason** |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

**[15]**

**7.**  Find the area in square cm of trapezium BCDE if the length of AC =20cm, DC = 12cm,



BE = 3cm and AE = 4cm. Use the following formula:

Area of trapesium: =

(5)

|  |  |
| --- | --- |
| Statement | Reason |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

**[5]**