|  |  |  |  |
| --- | --- | --- | --- |
| Year  9 | | *Basic Geometry* | Non Calculator |
| **Skills and Knowledge Assessed:**   * Use the language, notation and conventions of geometry * Identify line and rotational symmetries (ACMMG181 * Recognise the geometrical properties of angles at a point. | | | Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| * Identify corresponding, alternate and co­interior angles when two straight lines are crossed by a transversal (ACMMG163) * Investigate conditions for two lines to be parallel and solve simple numerical problems using reasoning (ACMMG164) * Demonstrate that the angle sum of a triangle is 180° and use this to find the angle sum of a quadrilateral (ACMMG166) * Classify triangles according to their side and angle properties and describe quadrilaterals (ACMMG165) * Establish properties of quadrilaterals using congruent triangles and angle properties, and solve related numerical problems using reasoning (ACMMG202) | | | |
| Section 1Short Answer Section | | | |
| Write all working and answers in the spaces provided on this test paper.  Provide mathematical reasoning and calculations to support your answer. | | | |
|  | Name the two angles which are shaded in the diagram below.    ……………………………………………………………………..  …………………………………………………………………….. | | |
|  | Draw any of the axes of line symmetry in this shape. | | |
|  | Find the size of  ………………………………………………  ……………………………………………….  ……………………………………………… | | |
|  | Find the value of *x*.  ………………………………………………  ………………………………………………. | | |
|  | Find the value of  ………………………………………………  ……………………………………………….  ……………………………………………… | | |
|  | Find the size of.  ………………………………………………  ……………………………………………….  ……………………………………………… | | |
|  | Find the size of  ………………………………………………  ……………………………………………….  ………………………………………………. | | |
|  | Find the value of  ………………………………………………  ……………………………………………….  ……………………………………………… | | |
|  | Find the value of *m*.  .........................................................................  ..........................................................................    .........................................................................  ......................................................................... | | |
|  | Find the value of *q*.  .........................................................................  ..........................................................................    .........................................................................  ......................................................................... | | |
|  | Use a protractor to draw. | | |
|  | Find the size of  ………………………………………………  ……………………………………………….  ……………………………………………… | | |
|  | What is the value of *b*?    .........................................................................  ..........................................................................    ......................................................................... | | |
|  | Use the grid provided to draw  which is an obtuse isosceles triangle. | | |
|  | Find the value of *k*.  ………………………………………………  ………………………………………………  ………………………………………………. | | |
|  | Find the value of  ………………………………………………  ……………………………………………….  ……………………………………………… | | |
|  | Find the value of *b*.    .........................................................................  ..........................................................................    .........................................................................  ......................................................................... | | |
|  | Find the value of *q*.    .........................................................................  ..........................................................................    .........................................................................  ......................................................................... | | |
|  | Find the size of  ………………………………………………  ……………………………………………….  ……………………………………………… | | |
|  | What is the value of *z*?    .........................................................................  ..........................................................................    ......................................................................... | | |
|  | *BC = BE*.  Find the value of *u*.  .........................................................................  ..........................................................................    .........................................................................  ......................................................................... | | |
|  | Find the size of    ………………………………………………  ……………………………………………….  ……………………………………………… | | |
|  | A regular pentagon is shown.  What is the value of *s*?  .........................................................................  ..........................................................................    ......................................................................... | | |
|  | Complete the missing spaces in the table of properties of quadrilaterals, by placing a tick or a cross in the appropriate spaces.   |  |  |  |  | | --- | --- | --- | --- | | PROPERTY | Kite | Parallelogram | Rhombus | | Opposite sides are equal | 🞬 | ✓ |  | | Diagonals meet at right angles. | ✓ |  | ✓ | | Opposite sides are parallel. |  | ✓ | ✓ | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| Year  9 | | *Basic Geometry* | Calculator Allowed |
| Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Section 2Multiple Choice Section | | | |
| Mark all your answers on the accompanying multiple choice answer sheet, not on this test paper. You may do any working out on this test paper. Calculators are allowed for this section.  **DIAGRAMS ARE NOT TO SCALE UNLESS OTHERWISE STATED.** | | | |
|  | Tessellations are tiling patterns. Which of the tessellations shown has both rotational symmetry and line symmetry?  A B. C. D. | | |
|  | Which diagram includes a pair of equal supplementary angles ?    A. B.  C. D. | | |
|  | What is the size of  A. 25o.  B. 50o.  C. 65o.  D. 155o. | | |
|  | Which figure shows a quadrilateral which has equal diagonals which bisect one another at right angles? (These figures are to scale)  A. B. C. D. | | |
|  | What is the value of *v* ?  A.  B.  C.  D. | | |
|  | What is the size of  A. 33o.  B. 50o.  C. 57o.  D. 123o. | | |
|  | What is the value of *x* ?  A.  B.  C.  D. | | |
|  | A quadrilateral is divided into two triangles by drawing in one diagonal.  Which description best represents the two triangles?  A. A right isosceles triangle and an equilateral triangle.  B. A right isosceles triangle and an acute isosceles triangle.  C. A right scalene triangle and an obtuse isosceles triangle.  D. A right scalene triangle and an acute isosceles triangle. | | |
|  | What is the value of  A. 73  B. 107  C. 146  D. 214 | | |
|  | What is the value of *y* ?  A.  B.  C.  D. | | |
|  | Which property is true for a parallelogram but not for a kite?  A. The diagonals intersect at right angles.  B. The opposite sides are parallel.  C. There are two pairs of equal sides.  D. There is one axis of symmetry. | | |
|  | What is the value of  A. 85  B. 95  C. 109  D. 119 | | |
|  | *ABCD* is a parallelogram.  *E* is a point on *AB* and *AC* and *DE* intersect at *F*.  What is the value of *y* ?  A.  B.  C.  D. | | |
|  | Which statement is true?  A.  B.  C.  D. No lines are parallel. | | |
|  | *PQRS* is a parallelogram.  *T* is a point on the side *PQ*.  What is the value of *x*?  A.  B.  C.  D. | | |

|  |  |  |
| --- | --- | --- |
| Year  9 | *Basic Geometry* | Calculator Allowed |
| Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Section 3Longer Answer Section | | |
| Answers should be supported by relevant mathematical reasoning and/or calculations.  Write all working and answers in the spaces provided on this test paper. | | |

|  | | **Marks** |
| --- | --- | --- |
|  | Complete the following using only the instruments indicated.  Do not erase any of your construction lines. |  |
| 1. | (a) Using only a protractor and straight edge, draw an angle of 125o. | **1** |
|  | (b) Use a protractor to measure the size of the angle PQR, indicated by the shading. | **1** |
|  | (c) i) Use a protractor to complete the table for the angles in this triangle.     |  |  | | --- | --- | | Angle | Size in degrees | | A |  | | B |  | | C |  | | **2** |
|  | ii) Use the results in the table above to illustrate the angle sum property of triangles. | **1** |
| 2. | (a) Using only a compass and straight edge, draw a line which passes through K and which is parallel to LM. | **2** |
|  | (b) A triangle has two sides, AB and BC, equal in length to the intervals below.  The angle BAC is 72o.  Using only a compass, protractor and straight edge accurately draw the triangle ABC. | **3** |

# Basic Geometry Test

# Multiple Choice Answer Sheet

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Completely fill the response oval representing the most correct answer.

1. A B C D

2. A B C D

3. A B C D

4. A B C D

5. A B C D

6. A B C D

7. A B C D

8. A B C D

9. A B C D

10. A B C D

11. A B C D

12. A B C D

13. A B C D

14. A B C D

15. A B C D

*Basic Geometry*

# ANSWERS

|  |  |
| --- | --- |
| Section 1 ( 1 mark each) | |
|  | Working and Answers |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  | One example, others possible. |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  | |  |  |  |  | | --- | --- | --- | --- | | PROPERTY | Kite | Parallelogram | Rhombus | | Opposite sides are equal | 🞬 | ✓ | **✓** | | Diagonals meet at right angles. | ✓ | **🞬** | ✓ | | Opposite sides are parallel. | **🞬** | ✓ | ✓ | |

|  |  |  |
| --- | --- | --- |
| Section 2 (1 mark each) | | |
|  | Working | Answers |
|  | Only B has both types. | B |
|  | Diagram A has a right angle on a straight line, so the supplementary angle is also 90o.  Hence equal supplementary angles. | A |
|  |  | D |
|  | The square has equal diagonals which bisect at right angles. | C |
|  |  | A |
|  |  | C |
|  |  | B |
|  | Left triangle has angles of 55o, 55o and 70o and two equal sides, so is an acute isosceles triangle.  Left triangle has angles of 90o, 41o and 49o and hence no equal sides, so is a right scalene triangle. | D |
|  |  | A |
|  |  | B |
|  | Opposite sides are parallel on a parallelogram, but not on a kite. | B |
|  |  | C |
|  |  | C |
|  | The cointerior angles between *AB* and *CD* both have a sum of 180o, while those between *EF* and *GH* have sums of 170o and 190o. Only *AB* and *CD* are parallel. | A |
|  |  | D |

|  |  |  |
| --- | --- | --- |
| Section 3 | |  |
|  | Working and Answers | Marks |
| 1. | (a) Using only a protractor and straight edge, draw an angle of 125o. | 1 |
|  | (b) Use a protractor to measure the size of the angle PQR, indicated by the shading. | 1 |
|  | (c) i) Use a protractor to complete the table for the angles in this triangle.     |  |  | | --- | --- | | Angle | Size in degrees | | A | 53o | | B | 87o | | C | 40o | | 2 marks deduct 1 for any error.  Allow error of up to 2 degrees. |
|  | ii) Use the results in the table above to illustrate the angle sum property of triangles. | 1 mark |
| 2. | a) | 2 marks for any valid method showing working lines.  1 mark if a reasonable attempt is made. |
|  | b) | 3 marks for any complete and correct method showing working lines.  2 marks for an almost correct or almost complete attempt.  1 mark if a start is made. |

*Multiple Choice Answer Sheet*

Name Marking Sheet

Completely fill the response oval representing the most correct answer.

1. A B C D

2. A B C D

3. A B C D

4. A B C D

5. A B C D

6. A B C D

7. A B C D

8. A B C D

9. A B C D

10. A B C D

11. A B C D

12. A B C D

13. A B C D

14. A B C D

15. A B C D