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| *School Name*  *Mathematics Test 2017* | | | |
| Year 8 | | *Polygons and Circles* | Calculator Allowed Test |
| **Skills and Knowledge Assessed:**   * Classify triangles according to their side and angle properties and describe quadrilaterals (ACMMG165) * Demonstrate that the angle sum of a triangle is 180° and use this to find the angle sum of a quadrilateral (ACMMG166) * Identify line and rotational symmetries (ACMMG181) * Investigate the relationship between features of  circles such as circumference, area, radius and diameter.  (ACMMG197) | | | Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Answer all questions in the spaces provided on this test paper by:  *Writing the answer in the box or on the lines provided.*  or  *Shading in the bubble for the correct answer from the four choices provided.*  Show any working out on the test paper.Calculators are allowed.  **Geometric Instruments are required for this test.** | | | |
|  | What type of quadrilateral is shown here?  A kite  A parallelogram  A rhombus.  A trapezium | | |
|  | Which figure shows an acute scalene triangle? (Diagrams are not to scale.) | | |
|  | Which figure shows an irregular pentagon? | | |
|  | In the design below, which type of triangle is **not** included?  Acute isosceles triangle  Obtuse isosceles triangle  Obtuse scalene triangle  Right scalene triangle | | |
|  | Which is a true statement about the kite shown?    The diagonals EG and FH are equal in length.  The diagonal EG is equal to the side FG.  The side FG is equal to the side FE.  The side EF is equal to the side EH. | | |
|  | *C* is the centre of the circle shown.  Write down the names of the two features of the circle, indicated by the arrows. | | |
|  | What is the size of  in the triangle below? | | |
|  | Is the triangle below, right angled ? ( Explain why.)    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | |
|  | Which figure shows an isosceles triangle? ( Diagrams are not to scale) | | |
|  | What is the value of  in the quadrilateral below? | | |
|  | A polygon has the properties listed below.   * Angle sum is 360o. * All sides are equal. * Does not include a right angle.   What name could be given to the polygon?  An equilateral triangle  An isosceles triangle  A rhombus  A square | | |
|  | Find the size of  in the diagram below. | | |
|  | *O* is the centre of the circle below.  What name is given to the shaded region?  A minor sector  A minor segment  A quadrant  A semicircle | | |
|  | Which of the following quadrilaterals could be either a convex or non-convex polygon?  A kite  A parallelogram  A rectangle  A rhombus | | |
|  | What is the value of | | |
|  | Which of the following has rotational symmetry but no line symmetry? | | |
|  | Find the value of  in the diagram below. | | |
|  | A regular octagon is shown below, with the opposite vertices joined by their diagonals.  Which of these shapes cannot be found within the diagram?  An isosceles triangle  A kite  An irregular pentagon  A rhombus | | |
|  | Which of the following quadrilaterals has diagonals which are equal and which bisect one another?  A kite  A parallelogram  A rectangle  A rhombus | | |
|  | What is the size of | | |
|  | Find the size of  . | | |
|  | Which statement describes the symmetry of this shape?  No line symmetry and rotational symmetry of order 3.  3 axes of symmetry and no rotational symmetry  3 axes of symmetry and rotational symmetry of order 3  6 axes of symmetry and rotational symmetry of order 6 | | |
|  | What is the value of | | |
|  | What is the value of *z*? | | |
|  | The figure *ABCD* is a rectangle and *AEFG* is a parallelogram.  What is the size of | | |
|  | When you think of a kite, a rhombus and a parallelogram, which of these properties is only true of the rhombus and not of the other two quadrilaterals?  Both diagonals are axes of line symmetry.  Each diagonal bisects the other.  The diagonals are equal.  The diagonals meet at right angles. | | |
|  | *O* is the centre of the circle and *P* and *Q* are points on its circumference.  What is the size of | | |
|  | Find the value of *x*. | | |
|  | What is the size of | | |
|  | *O* is the centre of the circle and *A, B* and *C* are points on its circumference.  Find an expression in terms of *c* for the size of | | |

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| *School Name*  *Mathematics Test 2017* | | |
| Year 8 | *Polygons and Circles* | Longer Answer  Section |
|  | | Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| ***Write all working and answers in the spaces provided on this test paper.***  ***Marks may not be awarded if working out and/or answers are not clear.***  ***Marks allocated are shown beside each question.***  ***Calculators are allowed.*** | | |

|  | | **Marks** |
| --- | --- | --- |
|  | 1. Use instruments to accurately draw a parallelogram *PQRS* and place markings on the diagram to show any equal sides and angles. | **2** |
|  | 1. Measure the angles in the parallelogram and use this to describe one of the angle properties of the parallelogram.   ……………………………………………………………………………………..  …………………………………………………………………………………….. | **2** |
|  | 1. *EFG* is an equilateral triangle and *FGH* is an isosceles triangle.       Find the size of , giving reasons for your answer.  ……………………………………………………………………………………..  ……………………………………………………………………………………..  …………………………………………………………………………………….. | **3** |
|  | (b) *STUV* is a kite. *SU* and *TV* are the diagonals which intersect at *W*.    Find the size of  *,* giving reasons for your answer.  ……………………………………………………………………………………..  ……………………………………………………………………………………..  …………………………………………………………………………………….. | **3** |

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ANSWERS

| Question | Working and Answer |
| --- | --- |
|  | Having all sides equal, it is a rhombus.  **3rd Answer** |
|  | Only figure 4 is both scalene and acute angled, (the missing angle is 83o.)  **4th Answer** |
|  | The 2nd and 3rd figures are pentagons, only the 3rd is irregular.  **3rd Answer** |
|  | There is no acute isosceles triangle  **1st Answer** |
|  | The sides adjacent to one another and on opposite sides of the axis of symmetry are equal, so side EF is equal to the side EH.  **4th Answer.** |
|  | A chord joins two points on the circumference.  A diameter joins two points on the circumference and passes through the centre.    Diameter  Chord |
|  |  |
|  |  |
|  | **3rd Answer** |
|  |  |
|  | * Angle sum is 360o. . It is a quadrilateral * All sides are equal. it is a rhombus (or square) * Does not include a right angle. . it isn’t a square so rhombus   **3rd Answer** |
|  |  |
|  | The region is cut off by a chord and makes up less than half of the circle, so it is a minor segment.  **2nd Answer** |
|  | **1st Answer** |
|  |  |
|  | The parallelogram (figure 2) has no line symmetry but has rotational symmetry of order 2. All of the others have line symmetry.  **2nd Answer** |
|  |  |
|  | A rhombus cannot be found.  **4th Answer** |
|  | A kite Diagonals could be equal but only one bisects the other  Parallelogram Diagonals are not equal  A rectangle Diagonals are equal and bisect one another  A rhombus Diagonals are not equal  **3rd Answer** |
|  |  |
|  | **3rd Answer** |
|  | There are 3 axes of symmetry as shown  There are 3 positions to which it can rotate, so order 3.  **3rd Answer** |
|  | **4th Answer** |
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|  |  |
|  | Both diagonals are axes of line symmetry. Only true of the rhombus, the parallelogram has no line symmetery and the kite has one diagoanl as an axis of symmetry  Each diagonal bisects the other. True of the rhombus and the parallelogram  The diagonals are equal. Not true of the rhombus  The diagonals meet at right angles. True of the rhombus and the kite  **1st Answer** |
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ANSWERS

| Question | Answer | Marks |
| --- | --- | --- |
| 1. | (a) | 2 marks for accurately drawn and labelled diagram.  1 mark if accuracy or labelling are lacking |
|  | (b) The angles above are 126o and 54o for example.  The opposite angles of the parallelogram are equal. The cointerior angles of the parallelogram are supplementary.  The angle sum is 360o. | 1 mark for accurately measured angles  1 mark for any correct statement about the angle properties |
| 2. | (a) | 3 marks for fully reasoned answer  2 marks for reasoned answer with minor error  1 mark if some minor progress made |
|  | (b) | 3 marks for fully reasoned answer  2 marks for reasoned answer with minor error  1 mark if some minor progress made |