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| Year  10 | *Geometric Reasoning* | Calculator Allowed |
| Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **Skills and Knowledge Assessed:**   * Apply logical reasoning, including the use of congruence and similarity, to proofs and numerical exercises involving plane shapes (ACMMG244) * Formulate proofs involving congruent triangles and angle properties (ACMMG243) | | |
| Extended Answer Test. | | |
| Answers should be supported by relevant mathematical reasoning and/or calculations  Marks will not be awarded for answers with no reasoning..  Complete any diagrams and write all working and answers in the spaces provided on this test paper. | | |

|  | | **Marks** |
| --- | --- | --- |
| 1. (a) | Find the value of *a*.  …………………………………………  ………………………………………….  ………………………………………… | **1** |
| (b) | Find the size of  …………………………………………  ………………………………………….  …………………………………………  ..………………………………………. | **1** |
| (c) | Find the value of *b*.  …………………………………………  ………………………………………….  …………………………………………  ..………………………………………. | **1** |
| 2. (a) | *KL*, *MN* and *QR* are straight lines which intersect at *P*.  Find the value of *s*.  …………………………………………  ………………………………………….  …………………………………………  ..………………………………………. | **2** |
| (b) | *BA, CA, DA* and *EA* intersect at *A*.  Find the value of *k*.  ………………………………………………  ……………………………………………….  ………………………………………………  ………………………………………………. | **2** |
| (c) | Find the value of *x*.  ………………………………………………  ……………………………………………….  ………………………………………………  ………………………………………………. | **2** |
| 3. (a) | Find the value of *y*.  ………………………………………………  ……………………………………………….  ………………………………………………  ………………………………………………. | **2** |
| (b) | Find the size of  .  ………………………………………………  ……………………………………………….  ………………………………………………  ………………………………………………. | **2** |
| (c) | *PQRS* is a kite whose diagonals intersect at *T*.  Find the size of  ………………………………………………  ……………………………………………….  ………………………………………………  ………………………………………. | **2** |
| 4. (a) | Prove that  ………………………………………………  ……………………………………………….  ………………………………………………  ………………………………………………. | **3** |
| (b) | Prove that  ………………………………………………  ……………………………………………….  ………………………………………………  ………………………………………………. | **3** |
| 5. (a) | ………………………………………………  ……………………………………………….  ………………………………………………  ………………………………………………. | **3** |
| (b) | i) A vertical tree EF casts a shadow FD which measures 12 m.  At the same time a vertical fence post BC casts a shadow CA which measures 3.6 m.  Prove that the triangles DEF and ABC are similar.    ……………………………………………………………………………………………….  ……………………………………………………………………………………………….  ……………………………………………………………………………………………….  ……………………………………………………………………………………………….  ………………………………………………    ………………………………………………. | **2** |
|  | ii) If the fence post BC is 2.4 metres high, what is the height of the tree EF?  ……………………………………………………………………………………………….  ……………………………………………………………………………………………….  ………………………………………………………………………………………………. | **1** |
| 6. a) | The circles are concentric with O as the centre.  PQ =SR.  Prove that  ….……………………………………  …….…………………………………  ……….………………………………  ………….……………………………  …………….…………………………. | **3** |
| b) | i) In ABC, *D* is the midpoint of *AB* and *E* is the midpoint of *BC*.    Prove that  |||  ……………………………………  ……………………………………  …………………………………….  …………………………………. | **2** |
|  | ii) DF is drawn parallel to BC. Prove that    ……………………………………  ……………………………………  …………………………………….  ……………………………………. | **3** |
|  | End of Test |  |

*Geometric Reasoning*

# ANSWERS

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| Section 3 | |  |
|  | Working and Answers | Marks |
| 1.  a) |  | 1 mark for answer with reasons |
| b) |  | 1 mark for answer with reasons |
| c) |  | 1 mark for answer with reasons |

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| --- | --- | --- |
| 2.  a) |  | 2 marks for correct answer with reasoning.  1 mark if an error in otherwise correct solution. |
| b) |  | 2 marks for correct answer with reasoning.  1 mark if an error in otherwise correct solution. |
| c) |  | 2 marks for correct answer with reasoning.  1 mark if an error in otherwise correct solution. |
| 3.  a) |  | 2 marks for correct answer with reasoning.  1 mark if an error in otherwise correct solution. |
| b) |  | 2 marks for correct answer with reasoning.  1 mark if an error in otherwise correct solution. |
| c) |  | 2 marks for correct answer with reasoning.  1 mark if an error in otherwise correct solution. |
| 4.  a) |  | 3 marks for correct & complete proof.  2 if a reason or statement is incorrect or missing  1 if one correct statement is made toward proof. |
| b) |  | 3 marks for correct & complete proof.  2 if a reason or statement is incorrect or missing  1 if one correct statement is made toward proof. |
| 5.  a) |  | 3 marks for correct & complete proof.  2 if a reason or statement is incorrect or missing  1 if one correct statement is made toward proof. |
| b) | i) | 2 marks for correct answer with reasoning.  1 mark if an error in otherwise correct solution |
| b) | ii) . | 1 mark for answer and working. |
| 6.  a) |  | 3 marks for correct & complete proof.  2 if a reason or statement is incorrect or missing  1 if one correct statement is made toward proof. |
| b) |  | 2 marks for correct answer with reasoning.  1 mark if an error in otherwise correct solution |
| b) | ii) | 3 marks for correct & complete proof.  2 if a reason or statement is incorrect or missing  1 if one correct statement is made toward proof. |