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| Year  10 | | *Enlargement & Similarity* | Calculator Allowed |
| **Skills and Knowledge Assessed:**   * Use the enlargement transformation to explain similarity and develop the conditions for triangles to be similar (ACMMG220) * Solve problems using ratio and scale factors in similar figures (ACMMG221) | | | Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **Section 1** Short Answer Section | | | |
| Write all working and answers in the spaces provided on this test paper. | | | |
|  | is drawn to be similar to  What scale factor was used in drawing ?  ..................................................................  ..................................................................    NOT TO  SCALE  ..................................................................  .................................................................. | | |
|  | By measurement and calculation, find the scale factor when the shaded triangle is enlarged to give the unshaded triangle.  ..................................................................  ..................................................................    ..................................................................  .................................................................. | | |
|  | Enlarge  with the centre of the enlargement at *O*, and a scale factor of 4, to produce an image  The position of *E’* has already been drawn. | | |
|  | Name a test that can be used to determine if two triangles are similar.  ……………………………………………………………………………………………….  ………………………………………………………………………………………………. | | |
|  | Two rectangles are similar. The smaller rectangle has sides 12 cm and 7 cm. The longer side of the large rectangle is 30 cm. How long is it’s the other side?  ……………………………………………………………………………………………….  ………………………………………………………………………………………………. | | |
|  | In the diagram, *CB* || *DE*.  Which test could be used to show that  (A full proof is not required.)  ………………………………………………  NOT TO  SCALE  ………………………………………………  ………………………………………………  ……………………………………………… | | |
|  | Explain why the two rhombuses below are not similar.  NOT TO  SCALE  ……………………………………………………………………………………………….  ………………………………………………………………………………………………. | | |
|  | What is the scale factor?  ..........................................................  ..........................................................  NOT TO  SCALE  ..........................................................  ......................................................... | | |
|  | Find the value of *x*.  NOT TO  SCALE  ………………………………………………………………………………………….  ………………………………………………………………………………………….  …………………………………………………………………………………………. | | |
|  | Find the length of *IJ*.  NOT TO  SCALE  ……………………………………………………………………………………………….  ……………………………………………………………………………………………….  ………………………………………………………………………………………………. | | |

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| Year  10 | | *Enlargement & Similarity* | Calculator Allowed |
|  | Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **Section 2** Multiple 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. | | | |
|  | Four rectangles are shown below.  NOT TO  SCALE  Which two are similar?  A. *P* and *Q* B. *P* and *S* C. *Q* and *R* D. *Q* and *S* | | |
|  | What is the enlargement factor?  NOT TO  SCALE  A. 2  B. 3  C. 4  D. 6 | | |
|  | Which of the following is always true?  A. All irregular hexagons are similar.  B. All regular hexagons are similar.  C. All rhombuses are similar.  D. All triangles are similar. | | |
|  | The plan of a building is drawn to a ratio of 1 : 30. If the width of the building on the plan is 105 cm, what is the width of the actual building?  A. 3.5 m B. 31.5 m C. 350 m D. 3 150 m | | |
|  | Which reason could be used to prove that  ?    A. *The three corresponding sides of the triangles are in the same ratio.*  B. *The three corresponding angles of the triangles are in the same ratio*  C. *The three corresponding angles of the triangles are equal.*  D. *Two corresponding sides of the triangles are in the same ratio and the included angle is equal.* | | |
|  | Which triangles are similar in the diagram below?  A.  B.  C.  D. | | |
|  | is an isosceles triangle with *GI* = *HI*.  Which additional piece of information would be enough to allow you to prove that  A.  B.  C.  D. | | |
|  | Karl prints a square photograph, then decides that he likes it so much he wants to print it again, 4 times larger, to put in a frame. The area of the original photograph was 100 cm2. What is the area of the enlarged photograph?  A. 25 cm2 B. 400 cm2 C. 800 cm2 D. 1 600 cm2 | | |
|  | Each side of  is five times the corresponding side of  What is the length of *BC* ?  A. 13 cm  B. 14 cm  NOT TO  SCALE  C. 21 cm  D. 195 cm | | |
|  | In the diagram, ,  What is the length of *PQ*?  NOT TO  SCALE  A. 15 cm  B. 54 cm  C. 117 cm  D. 135 cm | | |

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| Year  10 | *Enlargement & Similarity* | Calculator Allowed |
|  | Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **Section 3** Longer Answer Section | | |
| Write all working and answers in the spaces provided on this test paper. | | |

|  | | | **Marks** |
| --- | --- | --- | --- |
|  | Using the grid provided, or otherwise, draw the image of quadrilateral  after an enlargement with scale factor 3 and centre *O*. | | **3** |
|  | b) What is the length of the diagonal *S’U’*, correct to the nearest mm?  ……………………………………………………………………………………………….  ………………………………………………………………………………………………. | | **1** |
|  | NOT TO  SCALE | |  |
|  | a) Prove that  ……………………………………………  …………………………………………….  ……………………………………………  …………………………………………… | b) Find the length of *PQ*.  ……………………………………………  …………………………………………….  ……………………………………………  …………………………………………… | **5** |
| 3. | NOT TO  SCALE | |  |
|  | a) Prove that  ……………………………………………  …………………………………………….  ……………………………………………  …………………………………………… | b) Find the length of *TU*.  ……………………………………………  …………………………………………….  ……………………………………………  …………………………………………… | **5** |

*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

*Enlargement & Similarity*

ANSWERS

|  |  |
| --- | --- |
| Section 1 | |
|  | Scale factor |
|  | Each distance in the image is twice that in the original, so *k* = 2. |
|  |  |
|  | Any one of :  The corresponding angles of the two triangles are equal.  All the corresponding sides of the two triangles are in the same ratio.  Two pairs of corresponding sides of the triangles are in the same ratio, with the included angle equal. |
|  |  |
|  | There are two pairs of equal alternate angles on the parallel lines and a pair of equal vertically opposite angles, so corresponding angles being equal could be used to prove similarity. |
|  | The corresponding sides are in the same ratio.  Using the angle sum of the larger kite, find the two equal angles, call them *x*.    This is not the same as the corresponding angle in the other kite (123o) so the kites are not similar. |
|  | Corresponding sides are *OM* and *ZX*.  Scale factor = |
|  |  |
|  |  |

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| Section 2 | |
|  | D |
|  | C |
|  | B |
|  | B |
|  | C |
|  | A |
|  | A |
|  | D |
|  | C |
|  | B |

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| --- | --- |
| Section 3 | |
|  |  |
|  | b) By Measurement *S’U’* = 92 mm. |
| 2. | a) |
|  | b) |
| 3. | a) |
|  | b) |

*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