|  |  |  |  |
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| Year  10 | | *Non Linear Relations* | Calculator Allowed |
| **Skills and Knowledge Assessed:**   * Graph simple non­linear relations with and without the use of digital technologies and solve simple related equations (ACMNA296) * Explore the connection between algebraic and graphical representations of relations such as simple quadratics, circles and exponentials using digital technology as appropriate (ACMNA239) * 10A Describe, interpret and sketch parabolas, hyperbolas, circles and exponential functions and their transformations (ACMNA267) | | | Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **Section 1** Short Answer Section | | | |
| Write all working and answers in the spaces provided on this test paper. | | | |
|  | The graph of  is shown.  What is the value of *b* ?  ……………………………………………  …………………………………………….  …………………………………………… | | |
|  | The equation of the graph shown is  The graph passes through the point  What is the value of *a* ?  ………………………………………………  ……………………………………………….  ………………………………………………  ………………………………………………. | | |
|  | The graph of  is shown.  The dotted line is its axis of symmetry.  What are the coordinates of the points *A* and *B*?  …………………………………………  ………………………………………….  …………………………………………. | | |
|  | The curve below has equation  What are the coordinates of the points *C* and *D* ?  ………………………………………………  ……………………………………………….  ……………………………………………… | | |
|  | The graph of  is shown. Describe the intercept(s) that this graph has with the *x* and *y* axes.  ………………………………………………  ……………………………………………….  ………………………………………………  ………………………………………………. | | |
|  | What is the equation of the circle  shown?  ………………………………………………  ……………………………………………….  ……………………………………………… | | |
|  | Complete the table of values for the equation     |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | 1 | 2 | 4 | 5 | |  |  |  |  |  | | | |
|  | Why would there be no point where *x=3*, on the graph of the relation in question 7.  ……………………………………………………………………………………………….  ………………………………………………………………………………………………. | | |
|  | The graph of  is shown.  Draw a quick sketch, on the same set of axes, of  ……………………………………………  …………………………………………….  ……………………………………………… | | |
|  | What is the centre and radius of the circle which has an equation of  ……………………………………………………………………………………………….  ………………………………………………………………………………………………. | | |

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| Year  10 | | *Non Linear Relations* | Calculator Allowed  Section |
|  | 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. | | | |
|  | Which equation could describe the graph shown?  A.  B.  C.  D. | | |
|  | Which equation below would represent a parabola?  A.  B.  C.  D. | | |
|  | Which graph does not include the point ?    A.  B.  C.  D. | | |
|  | A circle on the number plane with centre at the origin and a radius of 9 units would have as its equation:  A. .  B. .  C. .  D. . | | |
|  | Which diagram below correctly shows the graphs of  and  ?  A. B.  C . D. | | |
|  | The graph of  would have *y* intercepts at:  A.  B.  C.  D. | | |
|  | Which diagram shows the graph of ?  A. B.  C. D. | | |
|  | Which equation could describe the graph shown?  A.  B.  C.  D. | | |
|  | Which diagram shows the graph of ?  A. B.  C. D. | | |
|  | The graph shown would have equation:  A.  B.    C.    D. | | |

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

|  | | **Marks** |
| --- | --- | --- |
|  | On the axes provided draw neat sketches of  and .  Clearly mark the *x* and *y* intercepts and the vertex of each graph. | **4** |
|  | On the axes provided draw neat sketches of  and .  Clearly mark the *x* and *y* intercepts and the vertex of each graph. | **4** |
|  | On the axes provided draw neat sketches of  and .  Clearly mark the *x* and *y* intercepts and the vertex of each graph. | **4** |

*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

*Non Linear Relations*

ANSWERS

|  |  |
| --- | --- |
| Section 1 | |
|  |  |
|  |  |
|  |  |
|  |  |
|  | The graph intercepts the  axis at  There is no intercept on the *x* axis. |
|  |  |
|  | |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | 1 | 2 | 4 | 5 | |  |  |  | 1 |  | |
|  | Substituting |

|  |  |
| --- | --- |
|  |  |
|  |  |

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

|  |  |  |
| --- | --- | --- |
| Section 3 | |  |
|  |  | 2 marks for each graph.  1 mark for general shape correctand 1 mark for specific details correct. |
|  |  | 2 marks for each graph.  1 mark for general shape correctand 1 mark for specific details correct |
|  |  | 2 marks for each graph.  1 mark for general shape correctand 1 mark for specific details correct |

*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