|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Year  10 | | Mathematics Test  Non Linear Relations | | Calculator Allowed |
| Short Answer Section | Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
|  | Write all working and answers in the spaces provided on this test paper. | | | |
| 1. | The graph of  is shown.  What are the coordinates of the points P and Q on the graph?  ....................................................................  ....................................................................  ...................................................................  ................................................................... | | | |
| 2. | Complete the table of values for the equation     |  |  |  |  |  | | --- | --- | --- | --- | --- | | *x* | -1 | 0 | 1 | 2 | | *y* |  |  |  |  | | | | |
| 3. | A sketch of the curve  has been started, for *x* values less than 0.  Complete the sketch of the graph  for *x* values greater than 0. | | | |
|  | **Questions 4-7 refer to the graph below**  The graph shows the water level in a storage dam over 16 hours. | | | |
| 4. | During the day, heavy rain caused the water level to rise. Between what times did this happen?  ..........................................................................................................................................................    .......................................................................................................................................................... | | | |
| 5. | As further rain was expected, water was released from the dam, starting at 2pm.  For how long was water released and when did it stop being released?  ..........................................................................................................................................................    .......................................................................................................................................................... | | | |
| 6. | Describe the rate at which the water was released.  ..........................................................................................................................................................    .......................................................................................................................................................... | | | |
| 7. | At 10 pm further rain caused the level to rise at 2 metres per hour. Complete the graph up to 12 midnight. | | | |
| 8. | What is the equation of the circle shown.  ..................................................................  ..................................................................  ..................................................................  ..................................................................  .................................................................. | | | |
| 9. | Draw a quick sketch of the exponential graph  showing any intercepts on the *x* and *y* axes.  .............................................................................  .............................................................................    .............................................................................  ............................................................................. | | | |
| 10. | The graph of  is shown on the diagram.  On the same axes draw a sketch of .  ..............................................................................  ............................................................................    ............................................................................  .............................................................................. | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Year  10 | | Mathematics Test  Non Linear Relations | | Calculator Allowed |
| Multiple Choice Section | Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
|  | 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. | | | |
| 1. | Which graph below could have an equation of  ?  A. B.  C . D. | | | |
| 2. | Which equation could describe the graph shown?  A.  B.  C.  D. | | | |
| 3. | A circle on the number plane with centre at the origin and a radius of 4 units would have as its equation:  A. .  B. .  C. .  D. . | | | |
| 4. | Which equation could describe the graph shown?  A.  B.  C.  D. | | | |
| 5. | The graph of  would have :  A. *x* intercepts at ±3 and a *y* intercept at -9.  B. *x* intercepts at ±9 and a *y* intercept at -3.  C. *y* intercepts at ±3 and an *x* intercept at -9.  D. *y* intercepts at ±9 and an *x* intercept at -3. | | | |
| 6. | As liquid is poured into a container at a constant rate, the level of liquid in the container rises. The graph at right shows the rise in the level over time.  Which container was being filled?  A. B.    C. D. | | | |
| 7. | Which graph would match the equation  ?   1. B.   C. D. | | | |
| 8. | A ball falls so that its height *h* at a time *t* is given by the equation  .  Which graph could represent this relation?   1. B.   C. D. | | | |
| 9. | Which equation could describe the graph shown?  A.  B.  C.  D. | | | |
| 10. | Which graph represents the equation  ?  A. B.   1. D. | | | |
| 11. | Which graph would represent the circle with equation?  A. B.  C. D. | | | |
| 12. | Which equation could describe the graph shown?  A.  B.  C.  D. | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Year  10 | | Mathematics Test  Non Linear Relations | | Calculator Allowed |
| Longer Questions | Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
|  | Write all working and answers in the spaces provided on this test paper.  Calculators are allowed for this section. | | | |
| 1. | On the axes provided draw neat sketches of  and .  Clearly mark the *x* and *y* intercepts and the vertex of each graph. | | | |
| 2. | On the axes provided draw neat sketches of  and .  Clearly mark the *x* and *y* intercepts and the asymptotes of each graph. | | | |
| 3. | On the axes provided draw neat sketches of  and .  Clearly mark the centre and radius of each circle. | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| Year  10 | Mathematics Test  Non Linear Relations | | Calculator 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

|  |  |
| --- | --- |
|  | Mathematics Test  Non Linear Relations |
| Answer Sheet |

|  |  |
| --- | --- |
| Short Answer | |
| 1 | P(2, 14) and Q (-3, 24) |
| 2 |  |
| 3 |  |
| 4 | Between 6 am and 11 am |
| 5 | For 5 hours ending at 7 pm |
| 6 | Released at a steady rate for 2 hours and then at a faster rate for the next 3 hours |
| 7 |  |
| 8 |  |
| 9 |  |
| 10 |  |

|  |  |
| --- | --- |
| Multiple Choice | |
| 1 | D |
| 2 | C |
| 3 | A |
| 4 | C |
| 5 | A |
| 6 | A |
| 7 | A |
| 8 | B |
| 9 | D |
| 10 | B |
| 11 | B |
| 12 | D |

|  |  |  |
| --- | --- | --- |
| Longer Answer | | |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |