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| *School Name*  *Mathematics Test 2017* | | | |
| Year 9 | | *Surds* | Non Calculator |
| **Skills and Knowledge Assessed:**   * Define rational and irrational numbers and perform operations with surds and fractional indices  (ACMNA264) | | | Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **Section 1** Short Answer Section | | | |
| Write all working and answers in the spaces provided on this test paper. | | | |
|  | Circle the irrational numbers in the list below. | | |
|  | Simplify :  ………………………………………………………………………………………………………… | | |
|  | Simplify :  ……………………………………………………………………………………………………… | | |
|  | Simplify :  ………………………………………………………………………………………………………… | | |
|  | Simplify :  ………………………………………………………………………………………………………… | | |
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|  | Simplify :  ………………………………………………………………………………………………………… | | |
|  | Simplify :  ………………………………………………………………………………………………………… | | |
|  | Simplify :  …………………………………………………………………………………………………………  ………………………………………………………………………………………………………… | | |
|  | Express with a rational denominator :  ………………………………………………………………………………………………………… | | |
|  | Express with a rational denominator :  ………………………………………………………………………………………………………… | | |
|  | Expand and simplify :  ………………………………………………………………………………………………………… | | |
|  | Expand and simplify :  …………………………………………………………………………………………………………  ………………………………………………………………………………………………………… | | |
|  | Expand and simplify :  …………………………………………………………………………………………………………  ………………………………………………………………………………………………………… | | |
|  | Express in simplest form, with a rational denominator :  …………………………………………………………………………………………………………  ………………………………………………………………………………………………………… | | |
|  | Expand and simplify :  ………………………………………………………………………………………………………  ………………………………………………………………………………………………………… | | |
|  | Find the values of *x* and *y* if  …………………………………………………………………………………………………………  ………………………………………………………………………………………………………… | | |
|  | Arrange the numbers in ascending order.  …………………………………………………………………………………………………………  ………………………………………………………………………………………………………… | | |

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| *School Name*  *Mathematics Test 2017* | | | |
| Year 9 | | *Surds* | 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. | | | |
|  | A.  B.  C.  D. | | |
|  | Which of the numbers below is an irrational number?  A.  B.  C.  D. | | |
|  | Simplify  A.  B.  C.  D. | | |
|  | A.  B.  C.  D. | | |
|  | A.  B.  C.  D. | | |
|  | Completely simplify  A.  B.  C.  D. | | |
|  | A.  B.  C.  D. | | |
|  | A.  B.  C.  D. | | |
|  | Which of the following is the largest?  A.  B.  C.  D. | | |
|  | A.  B.  C.  D. | | |
|  | Expand and simplify  A.  B.  C.  D. | | |
|  | A.  B.  C.  D. | | |
|  | Expand and simplify  A.  B.  C.  D. | | |
|  | Expand and simplify  A.  B.    C.  D. | | |
|  | Given that the centre for the arc drawn below is the point *O* on the number line, and *AB* is perpendicular to *OP*, what number is represented by the point *P*?    A.  B.  C.  D. | | |

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| *School Name*  *Mathematics Test 2017* | | |
| Year 9 | *Surds* | Calculator Allowed |
| Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **Section 3** Longer Answer Section | | |
| Write all working and answers in the spaces provided on this test paper. | | |

|  | | **Marks** |
| --- | --- | --- |
| 1. | 1. Express  with a rational denominator.   ……………………………………………………………………………………………….  ……………………………………………………………………………………………….  ……………………………………………………………………………………………….  ………………………………………………………………………………………………. | **2** |
|  | 1. Simplify the following, giving your answer as a single fraction in simplest form.     ……………………………………………………………………………………………….  ……………………………………………………………………………………………….  ……………………………………………………………………………………………….  ……………………………………………………………………………………………….  ……………………………………………………………………………………………….  ………………………………………………………………………………………………. | **3** |
|  | 1. Express   ……………………………………………………………………………………………….  ……………………………………………………………………………………………….  ………………………………………………………………………………………………... | **2** |

*School Name*

*Mathematics 2017*

*Multiple Choice Answer Sheet*

*Surds*

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

13. A B C D

14. A B C D

15. A B C D

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| *School Name*  *Mathematics Test 2017* | | |
| Year 9 | *Surds* | Non Calculator Section |

ANSWERS

| Question | Working and Answer |
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| *School Name*  *Mathematics Test 2017* | | |
| Year 9 | *Surds* | Calculator Allowed  Multiple Choice  Section |

ANSWERS

|  |  |  |
| --- | --- | --- |
| Question | Working | M C Answer |
|  |  | **C** |
|  |  | **A** |
|  |  | **D** |
|  |  | **D** |
|  |  | **B** |
|  |  | **A** |
|  |  | **D** |
|  |  | **B** |
|  |  | **A** |
|  |  | **C** |
|  |  | **C** |
|  |  | **A** |
|  |  | **B** |
|  |  | **D** |
|  |  | **B** |

*School Name*

*Mathematics 2017*

*Multiple Choice Answer Sheet*

*Surds*

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

13. A B C D

14. A B C D

15. A B C D

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| *School Name*  *Mathematics Test 2017* | | |
| Year 9 | *Surds* | Calculator Allowed  Longer Answer  Section |

ANSWERS

| Question | Working and Answer | Marks |
| --- | --- | --- |
| 1. | (a) | **2 marks for either of the last two lines of the solution shown.**  **1 mark for a basically correct attempt which has only a minor error or two in algebra or calculation, or is incomplete but has a correct beginning** |
|  | (b) | **3 marks for correct simplified answer.**  **2 marks for a basically correct attempt which has only a minor error or two in algebra or calculation, or is incomplete but has a correct beginning**  **1 mark for an attempt with some correct working.** |
|  | (c) | **2 marks for correct simplified answer.**  **1 mark for a basically correct attempt which has only a minor error or two in algebra or calculation, or is incomplete but has a correct beginning** |