

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.

1. Circle the irrational numbers in the list below.

$$\sqrt{48}, \sqrt{36}, 4\sqrt{25}, \frac{\sqrt{5}}{2}, \sqrt[3]{25}, \sqrt{18}, \sqrt[4]{16}.$$

2. Simplify : $6\sqrt{3} \times 4\sqrt{7}$.

.....

3. Simplify : $\frac{15\sqrt{35}}{3\sqrt{5}}$.

.....

4. Simplify : $6\sqrt{5} + 10\sqrt{5}$.

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5. Simplify : $(10\sqrt{5})^2$.

.....

6. Simplify : $6\sqrt{6} + 4\sqrt{6} - 7\sqrt{6}$.

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7.	Simplify : $\sqrt{300}$.
.....	
8.	Simplify : $\sqrt{48} + \sqrt{75}$.
.....	
9.	Simplify : $8\sqrt{3} - 2\sqrt{5} + 7\sqrt{3} - 6\sqrt{5}$.
.....	
10.	Simplify : $\sqrt{48} + \sqrt{28} + \sqrt{75} - \sqrt{63}$.
.....	
.....	
11.	Express with a rational denominator : $\frac{7}{\sqrt{2}}$.
.....	
12.	Express with a rational denominator : $\frac{5\sqrt{6}}{3\sqrt{5}}$.
.....	
13.	Expand and simplify : $5\sqrt{2} (6\sqrt{3} - 3\sqrt{2})$.
.....	
14.	Expand and simplify : $2\sqrt{6} (5\sqrt{2} - 3\sqrt{3})$.
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.....	

15. Expand and simplify : $\sqrt{10}(5\sqrt{2} - 3\sqrt{10}) - 7 + \sqrt{5}$.

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16. Express in simplest form, with a rational denominator : $\frac{6\sqrt{7} - 5}{4\sqrt{7}}$.

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17. Expand and simplify : $(5\sqrt{2} - 3\sqrt{5})(\sqrt{5} + 3\sqrt{2})$.

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18. Find the values of x and y if $8\sqrt{6}(5\sqrt{2} - 3\sqrt{24}) = x + y\sqrt{3}$.

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19. Arrange the numbers $4\sqrt{3}$, $2\sqrt{10}$, 6 , $3\sqrt{5}$, and $\sqrt{31}$ in ascending order.

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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.

- | | |
|----|--|
| 1. | $21\sqrt{7} - 8\sqrt{7} = ?$

A. $-13\sqrt{7}$ B. 13 C. $13\sqrt{7}$ D. $13\sqrt{14}$ |
| 2. | Which of the numbers below is an irrational number?

A. $\sqrt{24}$ B. $\sqrt{36}$ C. $\sqrt{64}$ D. $\sqrt{81}$ |
| 3. | Simplify $10\sqrt{2} + 7\sqrt{2} - 8\sqrt{2}$.

A. $2\sqrt{2}$ B. $2\sqrt{9}$ C. $3\sqrt{2}$ D. $9\sqrt{2}$ |
| 4. | $4\sqrt{3} \times 6\sqrt{10} = ?$

A. $10\sqrt{13}$ B. $10\sqrt{30}$ C. $24\sqrt{13}$ D. $24\sqrt{30}$ |
| 5. | $\frac{25\sqrt{35}}{5\sqrt{7}} = ?$

A. $5\sqrt{3}$ B. $5\sqrt{5}$ C. $7\sqrt{7}$ D. $20\sqrt{5}$ |

6.	Completely simplify $\sqrt{98}$.	A. $7\sqrt{2}$	B. $2\sqrt{7}$	C. $14\sqrt{7}$	D. $7\sqrt{14}$
7.	$\sqrt{75} + 6\sqrt{3} - \sqrt{48} = ?$	A. $-5\sqrt{3}$	B. $4\sqrt{3}$	C. $5\sqrt{3}$	D. $7\sqrt{3}$
8.	If $4\sqrt{6} + \sqrt{150} = a\sqrt{6}$, what is the value of a ?	A. $a = 6$	B. $a = 9$	C. $a = 18$	D. $a = 25$
9.	Which of the following is the largest?	A. $2\sqrt{57}$	B. $4\sqrt{14}$	C. 15	D. $6\sqrt{6}$
10.	Express $\frac{8\sqrt{3}}{3\sqrt{2}}$ with a rational denominator.	A. $\frac{\sqrt{6}}{3}$	B. $\frac{2\sqrt{6}}{3}$	C. $\frac{4\sqrt{6}}{3}$	D. $\frac{8\sqrt{6}}{3}$
11.	Expand and simplify $3\sqrt{6}(\sqrt{3} - 2\sqrt{6})$.	A. $9\sqrt{2} - 6$	B. $9\sqrt{2} - 12$	C. $9\sqrt{2} - 36$	D. $27\sqrt{2} - 36$
12.	When expressed with a rational denominator $\frac{2\sqrt{3} - 5}{4\sqrt{3}} = ?$	A. $\frac{6 - 5\sqrt{3}}{12}$	B. $\frac{18 - 5\sqrt{3}}{36}$	C. $\frac{6 + 5\sqrt{3}}{12}$	D. $\frac{18 + 5\sqrt{3}}{36}$

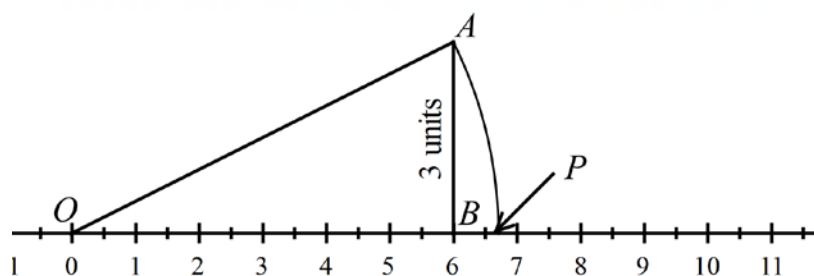
13. Expand and simplify $5\sqrt{2} - 3\sqrt{6} - \sqrt{6}(2\sqrt{3} - 5)$.

A. $2\sqrt{6} - 11\sqrt{2}$ B. $2\sqrt{6} - \sqrt{2}$
C. $8\sqrt{6} - \sqrt{2}$ D. $8\sqrt{6} - 11\sqrt{2}$

14. Expand and simplify $(2\sqrt{3} - 4)(3 - 4\sqrt{3})$.

A. $-10\sqrt{3} - 36$ B. $10\sqrt{3} - 12$
C. $10\sqrt{3} - 36$ D. $22\sqrt{3} - 36$

15. 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. $5\sqrt{3}$ B. $3\sqrt{5}$ C. $6\sqrt{3}$ D. $3\sqrt{6}$

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Section 3 Longer Answer Section

Write all working and answers in the spaces provided on this test paper.

Marks

1.

- a) Express $\frac{5\sqrt{3} - 4\sqrt{6}}{2\sqrt{3} - 3\sqrt{2}}$ with a rational denominator.

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- b) Simplify the following, giving your answer as a single fraction in simplest form.

3

$$\frac{4\sqrt{5} - 3}{\sqrt{10}} + \frac{1 - \sqrt{2}}{5\sqrt{2}}.$$

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Marks

c) Express $0.2\dot{1}\dot{5}$ as a fraction in simplest form.

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Multiple Choice Answer Sheet

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Name _____

Completely fill the response oval representing the most correct answer.

- | | | | | | | | | |
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| 1. | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 2. | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 3. | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 4. | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 5. | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 6. | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 7. | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
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| 13. | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 14. | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 15. | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |

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Non Calculator Section

ANSWERS

Question	Working and Answer
1.	$\boxed{\sqrt{48}}, \sqrt{36}, 4\sqrt{25}, \boxed{\frac{\sqrt{5}}{2}}, \boxed{\sqrt[3]{25}}, \boxed{\sqrt{18}}, \sqrt[4]{16}.$ <i>N.B.</i> $\sqrt{36} = 6$, $4\sqrt{25} = 4 \times 5 = 20$ and $\sqrt[4]{16} = 2$, so are rational.
2.	$6\sqrt{3} \times 4\sqrt{7} = 24\sqrt{21}$
3.	$\frac{15\sqrt{35}}{3\sqrt{5}} = 5\sqrt{7}$
4.	$6\sqrt{5} + 10\sqrt{5} = 16\sqrt{5}$
5.	$(10\sqrt{5})^2 = 10^2 \times (\sqrt{5})^2 = 100 \times 5 = 500$
6.	$6\sqrt{6} + 4\sqrt{6} - 7\sqrt{6} = 10\sqrt{6} - 7\sqrt{6} = 3\sqrt{6}$
7.	$\sqrt{300} = \sqrt{100} \times \sqrt{3}$ $= 10\sqrt{3}$
8.	$\sqrt{48} + \sqrt{75} = \sqrt{16} \times \sqrt{3} + \sqrt{25} \times \sqrt{3}$ $= 4\sqrt{3} + 5\sqrt{3}$ $= 9\sqrt{3}$

Question	Working and Answer
9.	$8\sqrt{3} - 2\sqrt{5} + 7\sqrt{3} - 6\sqrt{5} = 8\sqrt{3} + 7\sqrt{3} - 2\sqrt{5} - 6\sqrt{5}$ $= 15\sqrt{3} - 8\sqrt{5}$
10.	$\text{LHS} = \sqrt{48} + \sqrt{28} + \sqrt{75} - \sqrt{63}$ $= \sqrt{16} \times \sqrt{3} + \sqrt{4} \times \sqrt{7} + \sqrt{25} \times \sqrt{3} - \sqrt{9} \times \sqrt{7}$ $= 4\sqrt{3} + 2\sqrt{7} + 5\sqrt{3} - 3\sqrt{7}$ $= 4\sqrt{3} + 5\sqrt{3} + 2\sqrt{7} - 3\sqrt{7}$ $= 9\sqrt{3} - \sqrt{7}$
11.	$\frac{7}{\sqrt{2}} = \frac{7}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}}$ $= \frac{7\sqrt{2}}{2}$
12.	$\frac{5\sqrt{6}}{3\sqrt{5}} = \frac{5\sqrt{6}}{3\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}}$ $= \frac{5\sqrt{30}}{3\sqrt{25}}$ $= \frac{5\sqrt{30}}{3 \times 5}$ $= \frac{5\sqrt{30}}{15}$ $= \frac{\sqrt{30}}{3}$
13.	$5\sqrt{2} (6\sqrt{3} - 3\sqrt{2}) = 30\sqrt{6} - 15\sqrt{4}$ $= 30\sqrt{6} - 15 \times 2$ $= 30\sqrt{6} - 30$
14.	$2\sqrt{6} (5\sqrt{2} - 3\sqrt{3}) = 10\sqrt{12} - 6\sqrt{18}$ $= 10 \times \sqrt{4} \times \sqrt{3} - 6 \times \sqrt{9} \times \sqrt{2}$ $= 10 \times 2 \times \sqrt{3} - 6 \times 3 \times \sqrt{2}$ $= 20\sqrt{3} - 18\sqrt{2}$

Question	Working and Answer
15.	$ \begin{aligned} \text{LHS} &= \sqrt{10} (5\sqrt{2} - 3\sqrt{10}) - 7 + \sqrt{5} \\ &= 5\sqrt{20} - 3\sqrt{100} - 7 + \sqrt{5} \\ &= 5 \times \sqrt{4} \times \sqrt{5} - 3 \times \sqrt{100} - 7 + \sqrt{5} \\ &= 5 \times 2 \times \sqrt{5} - 3 \times 10 - 7 + \sqrt{5} \\ &= 10\sqrt{5} - 30 - 7 + \sqrt{5} \\ &= 11\sqrt{5} - 37 \end{aligned} $
16.	$ \begin{aligned} \frac{6\sqrt{7}-5}{4\sqrt{7}} &= \frac{6\sqrt{7}-5}{4\sqrt{7}} \times \frac{\sqrt{7}}{\sqrt{7}} \\ &= \frac{6\sqrt{49}-5\sqrt{7}}{4\sqrt{49}} \\ &= \frac{42-5\sqrt{7}}{28} \end{aligned} $
17.	$ \begin{aligned} \text{LHS} &= (5\sqrt{2} - 3\sqrt{5})(\sqrt{5} + 3\sqrt{2}) \\ &= 5\sqrt{2} \times \sqrt{5} + 5\sqrt{2} \times 3\sqrt{2} - 3\sqrt{5} \times \sqrt{5} - 3\sqrt{5} \times 3\sqrt{2} \\ &= 5\sqrt{10} + 15\sqrt{4} - 3\sqrt{25} - 9\sqrt{10} \\ &= 5\sqrt{10} + 15 \times 2 - 3 \times 5 - 9\sqrt{10} \\ &= 5\sqrt{10} + 30 - 15 - 9\sqrt{10} \\ &= 15 - 4\sqrt{10} \end{aligned} $
18.	$ \begin{aligned} \text{LHS} &= 8\sqrt{6} (5\sqrt{2} - 3\sqrt{24}) \\ &= 40\sqrt{12} - 24\sqrt{144} \\ &= 40 \times \sqrt{4} \times \sqrt{3} - 24 \times 12 \\ &= 40 \times 2 \times \sqrt{3} - 288 \\ &= 80\sqrt{3} - 288 \end{aligned} $ <p>Now $80\sqrt{3} - 288 = x + y\sqrt{3}$ so $x = -288$ and $y = 80$</p>

Question	Working and Answer
19.	$4\sqrt{3} = \sqrt{16} \times \sqrt{3} = \sqrt{48}$ $2\sqrt{10} = \sqrt{4} \times \sqrt{10} = \sqrt{40}$ $6 = \sqrt{36}$ $3\sqrt{5} = \sqrt{9} \times \sqrt{5} = \sqrt{45}$ $\sqrt{31} = \sqrt{31}$ <p>So in order</p> $\sqrt{31}, \sqrt{36}, \sqrt{40}, \sqrt{45}, \sqrt{48}$ $\sqrt{31}, 6, 2\sqrt{10}, 3\sqrt{5}, 4\sqrt{3}$

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ANSWERS

Question	Working	M C Answer
1.	$21\sqrt{7} - 8\sqrt{7} = (21 - 8)\sqrt{7} = 13\sqrt{7}$	C
2.	$\sqrt{24}$ is irrational $\sqrt{36} = 6$ $\sqrt{64} = 8$ $\sqrt{81} = 9$	A
3.	$10\sqrt{2} + 7\sqrt{2} - 8\sqrt{2} = 17\sqrt{2} - 8\sqrt{2}$ $= 9\sqrt{2}$	D
4.	$4\sqrt{3} \times 6\sqrt{10} = 4 \times 6 \times \sqrt{3 \times 10}$ $= 24\sqrt{30}$	D
5.	$\frac{25\sqrt{35}}{5\sqrt{7}} = \left(\frac{25}{5}\right) \times \sqrt{\frac{35}{7}}$ $= 5\sqrt{5}$	B
6.	$\sqrt{98} = \sqrt{49} \times \sqrt{2}$ $= 7\sqrt{2}$	A

7.	$\begin{aligned} \text{LHS} &= \sqrt{75} + 6\sqrt{3} - \sqrt{48} \\ &= \sqrt{25} \times \sqrt{3} + 6\sqrt{3} - \sqrt{16} \times \sqrt{3} \\ &= 5\sqrt{3} + 6\sqrt{3} - 4\sqrt{3} \\ &= 7\sqrt{3} \end{aligned}$	D
8.	$\begin{aligned} 4\sqrt{6} + \sqrt{150} &= 4\sqrt{6} + \sqrt{25} \times \sqrt{6} \\ &= 4\sqrt{6} + 5\sqrt{6} \\ &= 9\sqrt{6} \\ 9\sqrt{6} &= a\sqrt{6} \\ a &= 9 \end{aligned}$	B
9.	$\begin{aligned} 2\sqrt{57} &= \sqrt{4} \times \sqrt{57} = \sqrt{228} \\ 4\sqrt{14} &= \sqrt{16} \times \sqrt{14} = \sqrt{224} \\ 15 &= \sqrt{225} \\ 6\sqrt{6} &= \sqrt{36} \times \sqrt{6} = \sqrt{216} \end{aligned}$ <p>The first (A) is the largest</p>	A
10.	$\begin{aligned} \frac{8\sqrt{3}}{3\sqrt{2}} &= \frac{8\sqrt{3}}{3\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} \\ &= \frac{8\sqrt{6}}{3\sqrt{4}} \\ &= \frac{8\sqrt{6}}{3 \times 2} \\ &= \frac{8\sqrt{6}}{6} \\ &= \frac{4\sqrt{6}}{3} \end{aligned}$	C
11.	$\begin{aligned} 3\sqrt{6}(\sqrt{3} - 2\sqrt{6}) &= 3\sqrt{18} - 6\sqrt{36} \\ &= 3 \times 3\sqrt{2} - 6 \times 6 \\ &= 9\sqrt{2} - 36 \end{aligned}$	C

12.	$\frac{2\sqrt{3}-5}{4\sqrt{3}} = \frac{2\sqrt{3}-5}{4\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$ $= \frac{2\sqrt{9}-5\sqrt{3}}{4 \times 3}$ $= \frac{6-5\sqrt{3}}{12}$	A
13.	$\begin{aligned} \text{LHS} &= 5\sqrt{2} - 3\sqrt{6} - \sqrt{6}(2\sqrt{3} - 5) \\ &= 5\sqrt{2} - 3\sqrt{6} - 2\sqrt{18} + 5\sqrt{6} \\ &= 5\sqrt{2} - 3\sqrt{6} - 2 \times 3\sqrt{2} + 5\sqrt{6} \\ &= 5\sqrt{2} - 3\sqrt{6} - 6\sqrt{2} + 5\sqrt{6} \\ &= 2\sqrt{6} - \sqrt{2} \end{aligned}$	B
14.	$\begin{aligned} (2\sqrt{3}-4)(3-4\sqrt{3}) &= 6\sqrt{3} - 8\sqrt{9} - 12 + 16\sqrt{3} \\ &= 6\sqrt{3} - 24 - 12 + 16\sqrt{3} \\ &= 22\sqrt{3} - 36 \end{aligned}$	D
15.	<p>Let $OP = x$ By Pythagoras Theorem $x^2 = 6^2 + 3^2 = 36 + 9 = 45$ $x = \sqrt{45} = \sqrt{9} \times \sqrt{5}$ $= 3\sqrt{5}$</p>	B

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Multiple Choice Answer Sheet

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Completely fill the response oval representing the most correct answer.

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|-----|---|----------------------------------|---|----------------------------------|---|----------------------------------|---|----------------------------------|
| 1. | A | <input type="radio"/> | B | <input type="radio"/> | C | <input checked="" type="radio"/> | D | <input type="radio"/> |
| 2. | A | <input checked="" type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 3. | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input checked="" type="radio"/> |
| 4. | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input checked="" type="radio"/> |
| 5. | A | <input type="radio"/> | B | <input checked="" type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 6. | A | <input checked="" type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 7. | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input checked="" type="radio"/> |
| 8. | A | <input type="radio"/> | B | <input checked="" type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 9. | A | <input checked="" type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 10. | A | <input type="radio"/> | B | <input type="radio"/> | C | <input checked="" type="radio"/> | D | <input type="radio"/> |
| 11. | A | <input type="radio"/> | B | <input type="radio"/> | C | <input checked="" type="radio"/> | D | <input type="radio"/> |
| 12. | A | <input checked="" type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 13. | A | <input type="radio"/> | B | <input checked="" type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 14. | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input checked="" type="radio"/> |
| 15. | A | <input type="radio"/> | B | <input checked="" type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |

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ANSWERS

Question	Working and Answer	Marks
1.	$ \begin{aligned} \text{(a)} \quad \frac{5\sqrt{3} - 4\sqrt{6}}{2\sqrt{3} - 3\sqrt{2}} &= \frac{5\sqrt{3} - 4\sqrt{6}}{2\sqrt{3} - 3\sqrt{2}} \times \frac{2\sqrt{3} + 3\sqrt{2}}{2\sqrt{3} + 3\sqrt{2}} \\ &= \frac{10\sqrt{9} + 15\sqrt{6} - 8\sqrt{18} - 12\sqrt{12}}{(2\sqrt{3})^2 - (3\sqrt{2})^2} \\ &= \frac{30 + 15\sqrt{6} - 8 \times 3\sqrt{2} - 12 \times 2\sqrt{3}}{12 - 18} \\ &= \frac{30 + 15\sqrt{6} - 24\sqrt{2} - 24\sqrt{3}}{-6} \\ &= \frac{8\sqrt{2} + 8\sqrt{3} - 5\sqrt{6} - 10}{2} \end{aligned} $	<p>2 marks for either of the last two lines of the solution shown.</p> <p>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</p>
	$ \begin{aligned} \text{(b)} \quad \text{LHS} &= \frac{4\sqrt{5} - 3}{\sqrt{10}} + \frac{1 - \sqrt{2}}{5\sqrt{2}} \\ &= \frac{4\sqrt{5} - 3}{\sqrt{10}} \times \frac{\sqrt{10}}{\sqrt{10}} + \frac{1 - \sqrt{2}}{5\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} \\ &= \frac{4\sqrt{50} - 3\sqrt{10}}{10} + \frac{\sqrt{2} - \sqrt{4}}{5 \times 2} \\ &= \frac{4\sqrt{25} \times \sqrt{2} - 3\sqrt{10}}{10} + \frac{\sqrt{2} - 2}{10} \\ &= \frac{20\sqrt{2} - 3\sqrt{10} + \sqrt{2} - 2}{10} \\ &= \frac{21\sqrt{2} - 3\sqrt{10} - 2}{10} \end{aligned} $	<p>3 marks for correct simplified answer.</p> <p>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</p> <p>1 mark for an attempt with some correct working.</p>

Question	Working and Answer	Marks
	$\begin{aligned} \text{Let } x &= 0.2151515\dots \\ \text{(c) } 100x &= 21.5151\dots \\ 99x &= 21.5 - 0.2 = 21.3 \\ 990x &= 213 \\ x &= \frac{213}{990} \\ &= \frac{71}{330} \end{aligned}$	<p>2 marks for correct simplified answer.</p> <p>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</p>