

## Surds – The basics

Please write clearly in block capitals

Forename:

Surname:

### Materials

For this paper you must have:

- mathematical instruments



You must **not** use a calculator.

### Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer all questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

### Information

- The marks for questions are shown in brackets.
- You may ask for graph paper, tracing paper and more answer paper. These must be tagged securely to this answer book.

### Advice

- In all calculations, show clearly how you work out your answer.

1 Simplify the following expressions:

(Level 5)

1(a)  $2(\sqrt{5})$

[1 marks]

Answer \_\_\_\_\_

1(b)  $\sqrt{7} \times \sqrt{7}$

[1 mark]

Answer \_\_\_\_\_

1(c)  $(\sqrt{11})^2$

[1 mark]

Answer \_\_\_\_\_

1(d)  $\sqrt{8} \times \sqrt{2}$

[1 mark]

Answer \_\_\_\_\_

1(e)  $\sqrt{18} \times \sqrt{2}$

[1 mark]

Answer \_\_\_\_\_

Turn over for next question

**2** Write the following surds in the form  $a\sqrt{b}$  where a and b are integers.

(Level 5)

**2(a)**  $\sqrt{20}$

[1 mark]

Answer \_\_\_\_\_

**2(b)**  $\sqrt{45}$

[1 mark]

Answer \_\_\_\_\_

**2(c)**  $\sqrt{32}$

[1 mark]

Answer \_\_\_\_\_

**2(d)**  $\sqrt{24}$

[1 mark]

Answer \_\_\_\_\_

**2(e)**  $\sqrt{112}$

[1 mark]

Answer \_\_\_\_\_

Turn over for next question

**3** Simplify the following expressions:

(Level 5)

Give all answer in its simplest form.

**3(a)**  $3\sqrt{2} \times 3\sqrt{2}$

[1 mark]

Answer \_\_\_\_\_

**3(b)**  $\frac{\sqrt{50}}{5}$

[1 mark]

Answer \_\_\_\_\_

**3(c)**  $2(2\sqrt{2} \times 3\sqrt{2})$

[1 mark]

Answer \_\_\_\_\_

**3(d)**  $2\sqrt{2} \times 4\sqrt{5}$

[1 mark]

Answer \_\_\_\_\_

**3(e)**  $4\sqrt{24} - 5\sqrt{6}$

[1 mark]

Answer \_\_\_\_\_

Turn over for next question

Turn over ►

4

Simplify  $\sqrt{48} - \sqrt{12}$ 

(Level 6)

Giving your answer in the form  $m\sqrt{3}$  where  $m$  is an integer.**[3 marks]**

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Answer \_\_\_\_\_



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Turn over ►

5 Expand and simplify the following expressions

(Level 6)

5(a)  $(2 - \sqrt{3})(1 + \sqrt{3})$

[2 marks]

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Answer \_\_\_\_\_

5(b)  $(1 - \sqrt{5})(2 + \sqrt{3})$

[1 mark]

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Answer \_\_\_\_\_

5(c)  $(2 + 3\sqrt{4})(6 + 5\sqrt{3})$

[2 marks]

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Answer \_\_\_\_\_

End of questions