

Surds – Advanced

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 Rationalise the denominator of the following expressions

Give all answers in their simplest form.

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

[1 mark]

Answer _____

1(b) $\frac{\sqrt{7}}{\sqrt{3}}$

[1 mark]

Answer _____

1(c) $\frac{\sqrt{3} + 1}{\sqrt{6}}$

[1 mark]

Answer _____

1(d) $\frac{\sqrt{18} + 8}{\sqrt{3}}$

[2 marks]

Answer _____

Turn over for next question

2 Rationalise the denominator of the following expressions

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

[2 marks]

Answer _____

2(b) $\frac{3}{\sqrt{6} + 3}$

[2 marks]

Answer _____

2(c) $\frac{10}{\sqrt{7} - 6}$

[2 marks]

Answer _____

Turn over for next question

Turn over ►

3 Rationalise the denominator of the following expressions

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

[2 marks]

Answer _____

3(b) $\frac{3 + \sqrt{2}}{\sqrt{6} + 3}$

[2 marks]

Answer _____

3(c) $\frac{\sqrt{21} + 7}{\sqrt{21} - 7}$

[3 marks]

Answer _____

Turn over for next question

Turn over ►

- 4** Rationalise the denominators of the following expressions and simplify where possible.

4(a) $\frac{8 + \sqrt{5}}{4 - \sqrt{5}}$

[2 marks]

Answer _____

4(b) $\frac{1}{(5 - \sqrt{2})^2}$

[3 marks]

Answer _____

Turn over for next question

Turn over ►

5 Simplify,

$$\frac{6 - 5\sqrt{5}}{3\sqrt{5} - 2}$$

Give your answer in the form $a + b\sqrt{5}$, where a and b are rational numbers.

[4 marks]

Answer _____

- 6 Show that the following expression can be written in the form $k\sqrt{a}$, where k and a are integers

$$\frac{4}{3}\sqrt{\frac{300}{4}} + \frac{10}{\sqrt{3}}$$

[4 marks]

Answer _____

- 7 Show that the following expression can be written as $\frac{a}{b}\sqrt{c}$, where a , b and c are all integers:

$$\left(\frac{4}{3}\right)^{\frac{1}{2}} + \left(\frac{1}{3}\right)^{-\frac{1}{2}}$$

[3 marks]

Answer _____

Turn over for next question

Turn over ►

$$\sqrt{4\frac{12}{9}} + \left(\frac{1}{3}\right)^{\frac{1}{2}}$$

[4 marks]

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There is no text or other markings on the paper.

Answer



- ✔ All major GCSE maths topics covered
- ✔ Higher and foundation
- ✔ All exam boards - AQA, OCR, Edexcel, WJEC

Get them at mme.la/cards or scan the barcode 

