

SIMPLIFYING SURDS

GRADES 7-8

Examination practice questions

You should have:

A ruler, protractor, compasses, a pen, pencil, eraser, calculator.
For some questions, you may need tracing paper.

Instructions

- Use **black** ink or ball-point pen.
- Answer the questions in the spaces provided – *there may be more space than you need*.
- **Calculators may be used.**

Information

- The marks for each question are shown in brackets.
- If the number of marks for two similar questions isn't the same, this is likely due to them being modelled on different specifications. In this case, it is worth considering both mark schemes.
- Use the number of marks for each question as a guide as to how much time to spend on each question. As a rough guide, you can multiply the number of marks by 1.2 to see how many minutes you should spend on a question.
- Questions will generally get more challenging as the document progresses. Some of the latter questions will go beyond the core grade level for this topic.

Advice

- Read each question carefully before you start to answer it.
- Don't forget to have fun.
- Check your answers at the end.

Q1.

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Write $\sqrt{45}$ in the form $a\sqrt{5}$, where a is an integer.

$$\sqrt{45} = \sqrt{9} \times \sqrt{5} \quad (M_1)$$
$$= 3\sqrt{5} \quad (A_1)$$

(2 marks)

Q2.

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Write $\sqrt{50}$ in the form $k\sqrt{2}$, where k is an integer.

$$\sqrt{50} = \sqrt{25} \times \sqrt{2} \quad (M_1)$$
$$= 5\sqrt{2} \quad (A_1)$$

(2 marks)

Q3.

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Write $\sqrt{72}$ in the form $a\sqrt{2}$ where a is an integer.

$$\sqrt{72} = \sqrt{36} \times \sqrt{2} \quad (M_1)$$
$$= 6\sqrt{2} \quad (A_1)$$

(2 marks)

Q4.

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Write $\sqrt{80}$ in the form $c\sqrt{5}$, where c is a positive constant.

$$\sqrt{80} = \sqrt{16} \times \sqrt{5} \quad (M_1)$$
$$= 4\sqrt{5} \quad (A_1)$$

(2 marks)

Q5.

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Express $\sqrt{108}$ in the form $a\sqrt{3}$, where a is an integer.

$$\begin{aligned}\sqrt{108} &= \sqrt{36} \sqrt{3} \quad (M_1) \\ &= 6\sqrt{3} \quad (A_1)\end{aligned}$$

.....
(2 marks)

Q6.

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Simplify fully $\sqrt{200}$

$$\begin{aligned}\sqrt{200} &= \sqrt{100} \times \sqrt{2} \quad (M_1) \\ &= 10\sqrt{2} \quad (A_1)\end{aligned}$$

.....
(2 marks)

Q7.

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Simplify $\sqrt{396}$

$$\begin{aligned}\sqrt{396} &= \sqrt{36} \sqrt{11} \quad (M_1) \\ &= 6\sqrt{11} \quad (A_1)\end{aligned}$$

.....
(2 marks)

Write $\sqrt{8}$ in the form $m\sqrt{2}$, where m is an integer.

$$\sqrt{4} \sqrt{2} = \sqrt{8} \quad m_1$$

$$2\sqrt{2} = \sqrt{8} \quad A1$$

.....
(2 marks)

$8\sqrt{8}$ can be expressed in the form $m\sqrt{2}$ where m is a positive integer.

Express $8\sqrt{8}$ in the form $m\sqrt{2}$

$$\sqrt{8} = 2\sqrt{2} \quad m_1$$

$$8 \times 2\sqrt{2} = 16\sqrt{2} \quad A1$$

.....
(2 marks)