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GCSE Exam Questions

Multiplying and Dividing Surds | Number

GCSE Exam Questions: Multiplying and Dividing Surds

1) **(a)** Simplify fully: $\sqrt{8} \times \sqrt{5}$

(2)

(a) Simplify fully: $\dfrac{\sqrt{20}}{\sqrt{5}}$

(2)

(4 marks)

2) Work out the value of $(\sqrt{5})^2 \times (\sqrt{3})^2$.

(2 marks)

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

(3 marks)

4) $\sqrt{3}(\sqrt{6} + \sqrt{24})$ an be written in the form $a\sqrt{2}$.
Find the value of a.

(3 marks)

5) Show that $(10 - \sqrt{5})(2 + 4\sqrt{5})$ can be written in the form $a\sqrt{5}$,
where a is an integer to be found.

(3 marks)

6) Show that $(2\sqrt{8} + \sqrt{50})^2$ simplifies to an integer.

(3 marks)

GCSE Exam Questions: Multiplying and Dividing Surds Answers

	Question	Answer	Marks
1) (a)	Simplify fully: $\sqrt{8} \times \sqrt{5}$	**(a)** $\sqrt{8} \times \sqrt{5} = \sqrt{40}$ $\sqrt{40} = 2\sqrt{10}$ **or** $\sqrt{8} = 2\sqrt{2}$ $2\sqrt{2} \times \sqrt{5} = 2\sqrt{10}$	**(1)** **(1)** **(1)** **(1)**
(b)	Simplify fully: $\dfrac{\sqrt{20}}{\sqrt{5}}$	**(b)** $\sqrt{20} \div \sqrt{5} = \sqrt{4}$ $\sqrt{4} = 2$ **or** $\sqrt{20} = 2\sqrt{5}$ $2\sqrt{5} \div \sqrt{5} = 2$	**(1)** **(1)** **(1)** **(1)**
2)	Work out the value of $(\sqrt{5})^2 \times (\sqrt{3})^2$	$(\sqrt{5})^2 = 5$ *or* $(\sqrt{3})^2 = 3$ 15	**(1)** **(1)**
3)	Expand and simplify $(6 - 3\sqrt{2})(5 + 2\sqrt{2})$	$30 - 15\sqrt{2} + 12\sqrt{2} - 12$ Any two correct terms All four correct terms Simplified to $18 - 3\sqrt{2}$	 **(1)** **(1)** **(1)**
4)	$\sqrt{3}(\sqrt{6} + \sqrt{24})$ can be written in the form $a\sqrt{2}$. Find the value of a.	$\sqrt{24} = 2\sqrt{6}$ $\sqrt{3} \times 3\sqrt{6} = 3\sqrt{18}$ $3\sqrt{18} = 9\sqrt{2}$ *so* $a = 9$	**(1)** **(1)** **(1)**
5)	Show that $(10 - \sqrt{5})(2 + 4\sqrt{5})$ can be written in the form $a\sqrt{5}$, where a is an integer to be found.	$20 - 2\sqrt{5} + 40\sqrt{5} - 20$ Any two correct terms All four correct terms $38\sqrt{5}$ *so* $a = 38$	 **(1)** **(1)** **(1)**

GCSE Exam Questions: Multiplying and Dividing Surds Answers

	Question	Answer	Marks
6)	Show that $(2\sqrt{8} + \sqrt{50})^2$ simplifies to an integer.	$\sqrt{50} = 5\sqrt{2}$ *or* $\sqrt{8} = 2\sqrt{2}$ $4\sqrt{2} + 5\sqrt{2} = 9\sqrt{2}$ $(9\sqrt{2})^2 = 162$ **or** $32 + 2\sqrt{400} + 2\sqrt{400} + 50$ Any two correct terms All four correct terms $4\sqrt{400} = 4 \times 20 = 80$ *so* $32 + 80 + 50 = 162$	**(1)** **(1)** **(1)** **(1)** **(1)** **(1)**

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