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GCSE Exam Questions

Rationalise the Denominator | Number

GCSE Exam Questions: Rationalise the Denominator

1) Rationalise the denominator: $\frac{3}{\sqrt{11}}$

(1 mark)

2) Rationalise the denominator: $\frac{6}{\sqrt{3}}$

(2 marks)

3) Rationalise the denominator: $\frac{5\sqrt{2}}{\sqrt{7}}$

(2 marks)

4) Simplify fully: $\frac{\sqrt{6} + 12}{\sqrt{3}}$

(3 marks)

5) Simplify fully: $\frac{(3\sqrt{2} + 4)(3\sqrt{2} - 4)}{\sqrt{11}}$

(3 marks)

6) Rationalise the denominator: $\frac{10}{\sqrt{7} - 2}$

(3 marks)

7) Show that $\frac{12 + \sqrt{45}}{3\sqrt{5} - 6}$ can be written as $13 + 6\sqrt{5}$.

(3 marks)

GCSE Exam Questions: Rationalise the Denominator

8) Show that $\frac{3\sqrt{10}}{\sqrt{6}} - \frac{2\sqrt{5}}{\sqrt{12}}$ can be written in the form $\frac{a\sqrt{b}}{3}$, where a and b are integers to be found.

(5 marks)

GCSE Exam Questions: Rationalise the Denominator Answers

	Question	Answer	Marks
1)	Rationalise the denominator: $\frac{3}{\sqrt{11}}$	$\frac{3\sqrt{11}}{11}$	**(1)**
2)	Rationalise the denominator: $\frac{6}{\sqrt{3}}$	$\frac{6\sqrt{3}}{3}$ $2\sqrt{3}$	**(1)** **(1)**
3)	Rationalise the denominator: $\frac{5\sqrt{2}}{\sqrt{7}}$	$\frac{5\sqrt{14}}{a}$ *or* $\frac{5\sqrt{a}}{7}$ $\frac{5\sqrt{14}}{7}$	**(1)** **(1)**
4)	Simplify fully: $\frac{\sqrt{6}+12}{\sqrt{3}}$	$\frac{(\sqrt{6}+12)\times\sqrt{3}}{\sqrt{3}\times\sqrt{3}}$ $\frac{\sqrt{18}+12\sqrt{3}}{3}$ $\frac{3\sqrt{2}+12\sqrt{3}}{3} = \sqrt{2}+4\sqrt{3}$	**(1)** **(1)** **(1)**
5)	Simplify fully $\frac{(3\sqrt{2}+4)(3\sqrt{2}-4)}{\sqrt{11}}$	$(3\sqrt{2}+4)(3\sqrt{2}-4)$ $= 18+12\sqrt{2}-12\sqrt{2}-16$ At least 2 terms correct All 4 terms correct $\frac{2}{\sqrt{11}} = \frac{2\sqrt{11}}{11}$	 **(1)** **(1)** **(1)**
6)	Rationalise the denominator: $\frac{10}{\sqrt{7}-2}$	$\frac{10\times(\sqrt{7}+2)}{(\sqrt{7}-2)(\sqrt{7}+2)}$ Denominator $= 3$ $\frac{10\sqrt{7}+20}{3}$	**(1)** **(1)** **(1)**

GCSE Exam Questions: Rationalise the Denominator Answers

	Question	Answer	Marks
7)	Show that $\frac{12 + \sqrt{45}}{3\sqrt{5} - 6}$ can be written as $13 + 6\sqrt{5}$.	$\sqrt{45} = 3\sqrt{5}$ $\frac{(12 + 3\sqrt{5})(3\sqrt{5} + 6)}{(3\sqrt{5} - 6)(3\sqrt{5} + 6)}$ $\left(= \frac{36\sqrt{5} + 45 + 72 + 18\sqrt{5}}{9} \right)$ $\frac{117 + 54\sqrt{5}}{9} = 13 + 6\sqrt{5}$	**(1)** **(1)** **(1)**
8)	Show that $\frac{3\sqrt{10}}{\sqrt{6}} - \frac{2\sqrt{5}}{\sqrt{12}}$ can be written in the form $\frac{a\sqrt{b}}{3}$, where a and b are integers to be found.	Common denominator of $\sqrt{12}$ $\frac{3\sqrt{10} \times \sqrt{2}}{\sqrt{6} \times \sqrt{2}} = \frac{3\sqrt{20}}{\sqrt{12}} \left(= \frac{6\sqrt{5}}{\sqrt{12}} \right)$ $\frac{6\sqrt{5}}{\sqrt{12}} - \frac{2\sqrt{5}}{\sqrt{12}} = \frac{4\sqrt{5}}{\sqrt{12}} \left(= \frac{4\sqrt{5}}{2\sqrt{3}} \right)$ $\frac{4\sqrt{5} \times \sqrt{3}}{2\sqrt{3} \times \sqrt{3}}$ or correct attempt at rationalising their denominator $\frac{2\sqrt{15}}{3}$ *or* $a = 2, b = 15$ *seen*	**(1)** **(1)** **(1)** **(1)** **(1)**

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