Rationalising denominators

6 questions | 15 marks

Equivalent correct methods earn the corresponding marks.

1. Rationalise $\frac{3}{\sqrt{2}}$. [2 marks]

Multiply numerator and denominator by $\sqrt{2}$.

Answer: $\frac{3\sqrt{2}}{2}$

2. Rationalise $\frac{4}{\sqrt{8}}$. [2 marks]

$\frac{4}{2\sqrt{2}} = \frac{2}{\sqrt{2}} = \sqrt{2}$.

Answer: $\sqrt{2}$

3. Rationalise $\frac{1}{2+\sqrt{3}}$. [3 marks]

The conjugate product is $4 - 3 = 1$.

Answer: $2 - \sqrt{3}$

4. Rationalise $\frac{3}{\sqrt{5}-1}$. [3 marks]

Multiply by $\frac{\sqrt{5}+1}{\sqrt{5}+1}$; the denominator becomes $5 - 1 = 4$.

Answer: $\frac{3(\sqrt{5}+1)}{4}$

5. Simplify and rationalise $\frac{\sqrt{6}}{\sqrt{2}}$. [2 marks]

Combine the quotient as $\sqrt{\frac{6}{2}} = \sqrt{3}$.

Answer: $\sqrt{3}$

6. A rectangle has area $12\ \text{cm}^2$ and width $\sqrt{3}$ cm. Find its exact length. [3 marks]

Length $= \frac{12}{\sqrt{3}} = \frac{12\sqrt{3}}{3} = 4\sqrt{3}$ cm.

Answer: $4\sqrt{3}\ \text{cm}$