



Skill: Rationalising the denominator

Questions

Attempt these questions independently showing full and clear solutions. Check each answer as you go.

1. Rationalise the denominator of the following fractions:

a) $\frac{1}{\sqrt{3}}$

b) $\frac{1}{\sqrt{5}}$

c) $\frac{1}{\sqrt{6}}$

d) $\frac{1}{\sqrt{8}}$

e) $\frac{6}{\sqrt{2}}$

f) $\frac{12}{\sqrt{3}}$

g) $\frac{10}{3\sqrt{2}}$

2. Write the following in simplified surd form:

a) $\sqrt{45} + \frac{20}{\sqrt{5}}$

b) $5\sqrt{8} + \frac{6}{\sqrt{2}}$

c) $\frac{\sqrt{50} + \sqrt{18}}{\sqrt{8}}$

d) $\frac{\sqrt{63}}{3} + \frac{14}{\sqrt{7}}$

e) $\frac{\sqrt{75} - \sqrt{27}}{\sqrt{3}}$

3. Write the following in the form $a + b\sqrt{c}$ where $a, b, c \in \mathbb{Z}$.

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

b) $\frac{7+\sqrt{5}}{3+\sqrt{5}}$

c) $\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$

d) $\frac{\sqrt{2}+2}{3\sqrt{2}-4}$

e) $\frac{5+\sqrt{7}}{3-\sqrt{7}}$

f) $\frac{\sqrt{7}+1}{\sqrt{7}-2}$

4a. Express $\sqrt{45}$ in the form $n\sqrt{5}$ where $n \in \mathbb{N}$.

b. Hence solve the equation:

$$x\sqrt{20} = 7\sqrt{5} - \sqrt{45}$$

giving your answer in simplified surd form.