RATIONALISING DENOMINATORS

For questions **1** to **27**, express each fraction with a rational denominator.

1 $\frac{2}{\sqrt{3}}$ **2** $\frac{\sqrt{5}}{\sqrt{3}}$ **3** $\frac{3\sqrt{5}}{\sqrt{15}}$ **4** $\frac{1}{\sqrt{3}-\sqrt{2}}$

5 $\frac{1}{2\sqrt{7}+\sqrt{6}}$ **6** $\frac{1}{\sqrt{5}+2}$ **7** $\frac{1}{2\sqrt{5}-3\sqrt{2}}$ **8** $\frac{3\sqrt{2}}{\sqrt{5}-\sqrt{3}}$

13 $\frac{\sqrt{7}-2\sqrt{5}}{3\sqrt{5}-2\sqrt{2}}$ **14** $\frac{3\sqrt{2}+2\sqrt{3}}{3\sqrt{2}-2\sqrt{3}}$ **15** $\frac{5\sqrt{3}+3\sqrt{5}}{5\sqrt{5}-3\sqrt{3}}$ **16** $\frac{2\sqrt{3}}{3\sqrt{3}-2}$

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21 $\dfrac{\sqrt{3}}{\sqrt{24}-\sqrt{48}}$ **22** $\dfrac{\sqrt{2}-1}{\sqrt{2}+1}$ **23** $\dfrac{2\sqrt{5}-\sqrt{2}}{2\sqrt{5}+\sqrt{2}}$ **24** $\dfrac{\sqrt{6}+2\sqrt{3}}{2\sqrt{6}-\sqrt{3}}$

29 If $x=\sqrt{3}+1$, find the value of $x^2-\dfrac{1}{x^2}$.

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For questions **36** to **44**, express as a single fraction with a rational denominator:

36 $\dfrac{1}{2\sqrt{3}-1}+\dfrac{3}{\sqrt{3}+1}$

37 $\dfrac{\sqrt{5}+\sqrt{2}}{\sqrt{5}-\sqrt{2}}-\dfrac{\sqrt{5}-\sqrt{2}}{\sqrt{5}+\sqrt{2}}$

38 $\dfrac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}\times\dfrac{2\sqrt{2}-\sqrt{3}}{2\sqrt{2}+\sqrt{3}}$

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42 $\dfrac{\sqrt{3}-1}{\sqrt{3}+2}-\dfrac{\sqrt{5}-\sqrt{3}}{2\sqrt{5}+\sqrt{3}}$

43 $\dfrac{2\sqrt{5}}{\sqrt{10}-\sqrt{15}}-\dfrac{3\sqrt{7}}{\sqrt{35}-\sqrt{14}}$

44 $\dfrac{1}{x-1}+\dfrac{1}{x+1}-\dfrac{2}{x^2-1}$, where $x=2\sqrt{3}+1$