ILLAWARRA TUTORING

This worksheet focuses on rationalising the denominator. You will learn how to eliminate surds from the denominator of fractions by multiplying by an appropriate form of one so that the denominator becomes a rational number.

Easy Questions

1. Rationalise the denominator of $\frac{1}{\sqrt{2}}$.
2. Rationalise the denominator of $\frac{3}{\sqrt{5}}$.
3. Rationalise the denominator of $\frac{2}{3\sqrt{7}}$.
4. Rationalise the denominator of $\frac{4}{\sqrt{11}}$.
5. Rationalise the denominator of $\frac{5}{\sqrt{8}}$.

Intermediate Questions

6. Rationalise the denominator of $\frac{1}{2+\sqrt{3}}$.
7. Rationalise the denominator of $\frac{1}{3-\sqrt{2}}$.
8. Rationalise the denominator of $\frac{2}{1+2\sqrt{3}}$.
9. Rationalise the denominator of $\frac{\sqrt{5}}{2-\sqrt{2}}$.
10. Rationalise the denominator of $\frac{3}{\sqrt{7}+\sqrt{3}}$.
11. Rationalise the denominator of $\frac{4}{3+\sqrt{5}}$.
12. Rationalise the denominator of $\frac{5}{\sqrt{11}-2}$.

13. Rationalise the denominator of $\dfrac{2\sqrt{3}}{1-\sqrt{2}}$.

14. Rationalise the denominator of $\dfrac{2}{\sqrt{3}+\sqrt{2}}$.

15. Rationalise the denominator of $\dfrac{3}{\sqrt{5}-\sqrt{3}}$.

16. Rationalise the denominator of $\dfrac{2+\sqrt{3}}{1-\sqrt{3}}$.

17. Rationalise the denominator of $\dfrac{7}{2\sqrt{2}+\sqrt{3}}$.

18. Rationalise the denominator of $\dfrac{1}{\sqrt{6}-\sqrt{2}}$.

19. Rationalise the denominator of $\dfrac{4}{3\sqrt{3}+2\sqrt{2}}$.

20. Rationalise the denominator of $\dfrac{\sqrt{7}}{2\sqrt{2}-\sqrt{3}}$.

Hard Questions

21. Simplify and rationalise: $\dfrac{2}{\sqrt{3}+\sqrt{5}}+\dfrac{1}{\sqrt{3}-\sqrt{5}}$.

22. Show that $\dfrac{1}{2+\sqrt{3}}+\dfrac{1}{2-\sqrt{3}}$ simplifies to an integer and state that integer.

23. Rationalise and simplify: $\dfrac{3\sqrt{2}}{5-\sqrt{2}}$.

24. Given $E=\dfrac{4}{\sqrt{8}+\sqrt{2}}$, rationalise the denominator and simplify the expression.

25. Rationalise and simplify: $\dfrac{2}{\sqrt{5}-\sqrt{3}}-\dfrac{3}{\sqrt{5}+\sqrt{3}}$.

26. Express $\dfrac{1}{\sqrt{2}}+\dfrac{1}{\sqrt{8}}$ in its simplest form after rationalising the denominators.

27. Express in simplest form by rationalising the denominator: $\dfrac{3\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$.

28. Simplify: $\dfrac{2}{\sqrt{2}+\sqrt{3}}+\dfrac{3}{\sqrt{2}-\sqrt{3}}$.

29. Rationalise and simplify: $\dfrac{\sqrt{5}}{2+\sqrt{3}}+\dfrac{\sqrt{5}}{2-\sqrt{3}}$.

30. If $x = \dfrac{1}{\sqrt{3+2\sqrt{2}}}$, express x in the form $\sqrt{a} - \sqrt{b}$ where a and b are positive integers.