

2.5 Practice Set

1. Why do we rationalize denominators?
2. What role does the conjugate play in rationalizing the denominator?
3. Does rationalizing the denominator change the expression? Why or why not?

Find the conjugate of each of the following expressions.

4. $a + b$

5. $13 + \sqrt{x}$

6. $\sqrt{r} - \sqrt{s}$

Rationalize the denominator and simplify if possible.

Assume that all variables represent positive real numbers.

7. $\frac{\sqrt{5}}{\sqrt{3}}$

8. $\sqrt{\frac{1}{17}}$

9. $\frac{4}{\sqrt[3]{25y^2}}$

10. $\frac{5}{\sqrt{3x}}$

11. $\sqrt[3]{\frac{3}{2}}$

$$12. \quad \sqrt{\frac{5x}{18}}$$

$$13. \quad \sqrt[4]{\frac{16}{9y^5}}$$

$$14. \quad \frac{7b}{\sqrt[5]{8b^2}}$$

$$15. \quad \frac{9}{1-\sqrt{2}}$$

$$16. \quad \frac{\sqrt{6}}{\sqrt{3}+\sqrt{2}}$$

$$17. \quad \frac{\sqrt{x}}{\sqrt{x}+\sqrt{y}}$$

$$18. \quad \frac{3\sqrt{2}-\sqrt{5}}{4\sqrt{2}+\sqrt{5}}$$

$$19. \quad \frac{\sqrt{x}-2\sqrt{y}}{3\sqrt{x}+\sqrt{y}}$$

$$20. \quad \frac{4+\sqrt{a}}{3\sqrt{a}-7}$$

Distributed Practice Problems

Perform the indicated operation and/or simplify each of the following.
Assume that all variables represent positive real numbers.

$$21. \quad \frac{(4x^6y^{-8})^{-\frac{3}{2}}}{\left(27x^{\frac{4}{3}}y^{-1}\right)^{\frac{1}{3}}}$$

$$22. \quad b\sqrt[3]{108a^5b^2} - a\sqrt[3]{32a^2b^5} + ab\sqrt{4a^2b^2}$$

$$23. \quad \sqrt[4]{2x^7y^2} \cdot \sqrt[4]{8xy^3}$$

$$24. \quad (\sqrt{11y} - 7\sqrt{3x})(\sqrt{11y} + 7\sqrt{3x})$$

$$25. \quad \frac{4\sqrt[3]{32z^{12}}}{\sqrt[3]{4z^2}}$$