

5.2 Extra Practice

In Exercises 1–6, use the properties of rational exponents to simplify the expression.

1. $\frac{2^{2/5}}{2}$

2. $\left(\frac{3^6}{12^6}\right)^{-1/6}$

3. $(11^{3/2} \cdot 11^{-5/2})^{-1/3}$

4. $(9^{-3/5} \cdot 9^{1/5})^{-1}$

5. $\frac{3^{3/4} \cdot 27^{3/4}}{9^{3/4}}$

6. $\frac{25^{5/9} \cdot 25^{7/9}}{5^{4/3}}$

In Exercises 7–12, use the properties of radicals to simplify the expression.

7. $\sqrt[3]{25} \cdot \sqrt[3]{625}$

8. $\sqrt[5]{6} \cdot \sqrt[5]{81}$

9. $\frac{\sqrt[4]{176}}{\sqrt[4]{11}}$

10. $\frac{\sqrt{7}}{\sqrt{700}}$

11. $\frac{\sqrt[3]{5} \cdot \sqrt[3]{50}}{\sqrt[3]{2}}$

12. $\frac{\sqrt[4]{4} \cdot \sqrt[4]{12}}{\sqrt[8]{3} \cdot \sqrt[8]{3}}$

In Exercises 13–18, write the expression in simplest form.

13. $\frac{\sqrt[3]{4}}{\sqrt[3]{9}}$

14. $\sqrt[3]{\frac{4}{25}}$

15. $\sqrt[4]{\frac{2401}{4}}$

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

17. $\frac{6}{\sqrt{2} + \sqrt{7}}$

18. $\frac{\sqrt{2}}{\sqrt{15} - \sqrt{3}}$

In Exercises 19–24, simplify the expression.

19. $10(25^{2/3}) - 6(25^{2/3})$

20. $2\sqrt{54} - 11\sqrt{6}$

21. $13\sqrt[3]{3} - \sqrt[3]{375}$

22. $\sqrt[5]{486} + 10\sqrt[5]{2}$

23. $4(48^{1/4}) - 3(3^{1/4})$

24. $(7^{1/3}) + 4(189^{1/3})$

In Exercises 25–27, write the expression in simplest form. Assume all variables are positive.

25. $\sqrt[3]{125x^6y^{12}}$

26. $\sqrt[5]{\frac{32r^{10}}{p^{25}}}$

27. $\sqrt[7]{\frac{n^{12}p^3}{n^{-2}p^{24}}}$

28. The formula for the volume of a right circular cylinder is $V = 9\pi r^2$, where r is the radius.

a. Solve $V = 9\pi r^2$ for r .

b. Substitute the expression for r from part (a) into the formula for the surface area of a right cylinder, $S = 18\pi r + \pi r^2$.

c. Use the answer to part (b) to find the surface area of a right cylinder when the volume is 108 cubic meters.