

Chapter 9
Form D

For problems 1 – 3, find the indicated root, or state that the expression is not a real number.

1. $\sqrt{196}$
a. 128 b. 14 c. 16 d. Not a real number
2. $\sqrt[3]{-27}$
a. -3 b. 3 c. -9 d. Not a real number
3. $\sqrt{64}$
a. 8 b. -8 c. -32 d. Not a real number

For problems 4 – 6, simplify by first writing the expression in radical form.

4. $121^{\frac{1}{2}}$
a. $\frac{1}{(121)^2} = \frac{1}{14,641}$ b. $\frac{1}{2}(121) = \frac{121}{2}$ c. $\sqrt{121} = 11$ d. $\frac{1}{\sqrt{121}} = \frac{1}{11}$
5. $-81^{\frac{3}{4}}$
a. $-(\sqrt[4]{81})^3 = -27$ b. $\frac{1}{(\sqrt[4]{81})^3} = \frac{1}{27}$ c. $-\frac{1}{(\sqrt[4]{81})^3} = -\frac{1}{27}$ d. Not a real number
6. $125^{\frac{2}{3}}$
a. $(\sqrt[3]{125})^2 = 25$ b. $(\sqrt{125})^3 = 625\sqrt{5}$ c. $\frac{1}{(\sqrt[3]{125})^3} = \frac{1}{25}$ d. $\frac{250}{3}$

For problems 7 – 9, simplify each expression.

7. $4\sqrt{32}$
a. $\sqrt{128}$ b. $64\sqrt{2}$ c. $8\sqrt{2}$ d. $16\sqrt{2}$
8. $\sqrt[3]{108x^8}$
a. $3x^2\sqrt[3]{4}$ b. $36x^2\sqrt[3]{x^2}$ c. $36x^2$ d. $3x^2\sqrt[3]{4x^2}$
9. $\sqrt{200x^6}$
a. $10x^3\sqrt{2}$ b. $10x^4\sqrt{2x}$ c. $100x^4\sqrt{x}$ d. $100x^3$

For problems 10 – 19, perform the indicated operation and , if possible, simplify.

10. $\sqrt{11} \cdot \sqrt{22}$

a. $11\sqrt{2}$

b. $\sqrt{242}$

c. 121

d. 22

11. $\sqrt[3]{24} \cdot \sqrt[3]{4}$

a. $8\sqrt[3]{3}$

b. $4\sqrt[3]{3}$

c. $2\sqrt[3]{12}$

d. $4\sqrt[3]{6}$

12. $\sqrt{\frac{7}{3}} \cdot \sqrt{\frac{21}{3}}$

a. $\frac{\sqrt{147}}{3}$

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

c. 7

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

13. $\frac{\sqrt{80x^4}}{\sqrt{x^2}}$

a. $2x^2\sqrt{20}$

b. $4x\sqrt{5}$

c. $4x\sqrt{5x}$

d. $4x^2\sqrt{5}$

14. $\sqrt{20x^4} \cdot \sqrt{10x^5}$

a. $100x^4\sqrt{x}$

b. $10x^4\sqrt{2x}$

c. $10x^3\sqrt{2}$

d. $10x^3\sqrt{2x}$

15. $7\sqrt{32} - 4\sqrt{8} + 5\sqrt{18}$

a. $141\sqrt{2}$

b. $8\sqrt{42}$

c. $35\sqrt{2}$

d. $8\sqrt{58}$

16. $\sqrt{7}(3\sqrt{7} - 2\sqrt{3})$

a. $21 - 2\sqrt{21}$

b. $147 - 2\sqrt{21}$

c. $21\sqrt{7} - 14\sqrt{3}$

d. $21 - 2\sqrt{3} \cdot \sqrt{7}$

17. $(4\sqrt{5} - 3)(2\sqrt{5} - 4)$

a. $28 - 22\sqrt{5}$

b. $52 - 10\sqrt{5}$

c. $52 - 22\sqrt{5}$

d. 188

18. $(8 + \sqrt{6})(8 - \sqrt{6})$

a. $58 + 16\sqrt{6}$

b. $58 - 16\sqrt{6}$

c. -58

d. 58

19. $(5 - \sqrt{5})^2$

a. $30 - 10\sqrt{5}$

b. 20

c. 25

d. $20 + 10\sqrt{5}$

For problems 20 – 21, rationalize each denominator and, if possible, simplify.

20. $\sqrt{\frac{12}{5}}$

a. $\frac{2\sqrt{15}}{5}$

b. $2\sqrt{3}$

c. $\frac{2\sqrt{3}}{25}$

d. $\sqrt{12}$

21. $\frac{4}{\sqrt{7}-2}$

a. $\frac{2\sqrt{7}+1}{3}$

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

c. $\frac{4\sqrt{7}+8}{3}$

d. $\frac{4\sqrt{7}-8}{3}$

For problems 22 – 24, solve each radical equation. If the equation has no solution, so state.

22. $\sqrt{2x+4} = 2$

a. $\{-2\}$

b. $\{0\}$

c. $\{4\}$

d. No solution

23. $\sqrt{4x-5} + 3 = 2$

a. $\left\{\frac{15}{2}\right\}$

b. $\left\{\frac{3}{2}\right\}$

c. $\left\{-\frac{3}{2}\right\}$

d. No solution

24. $\sqrt{5x+6} = x$

a. $\{-1, 6\}$

b. $\{-1\}$

c. $\{6\}$

d. No solution

25. The distance to the horizon that you see, measured in miles, on the top of a mountain H feet high is modeled by the formula $D = \sqrt{2H}$. At the top of an extinct volcano the view extends 120 miles to the horizon. How high is the volcano?

a. 28,800 ft

b. 60 ft

c. 3600 ft

d. 7200 ft