

Name _____

8-7B Lesson Master**Questions on SPUR Objectives**

See Student Edition pages 574–577 for objectives.

VOCABULARY

- Fill in the Blank** When x is negative and n is _____, then $\sqrt[n]{x}$ stands for the real n th root of x .
- Fill in the Blank** When $\sqrt[n]{x}$ and $\sqrt[n]{y}$ are defined and are real numbers, then $\sqrt[n]{xy}$ is also defined and $\sqrt[n]{xy} = \underline{\hspace{2cm}}$.

SKILLS Objective C

Multiple Choice In 3–8, determine which of the following describes the expression.

- | | |
|---------------------------------|---------------------------------|
| A defined, real positive number | B defined, real negative number |
| C defined, nonreal number | D not defined |
| 3. $\sqrt[3]{-20}$ _____ | 4. $\sqrt{-18}$ _____ |
| 5. $\sqrt{12}$ _____ | 6. $\sqrt[6]{-64}$ _____ |
| 7. $\sqrt[4]{5}$ _____ | 8. $\sqrt[11]{-9}$ _____ |

In 9–22, evaluate each radical expression. Work by hand; check with a CAS.

- | | |
|-------------------------------------------|-----------------------------------------------|
| 9. $\sqrt[5]{-243}$ _____ | 10. $\sqrt[7]{-128}$ _____ |
| 11. $\sqrt[3]{-27} + \sqrt[5]{-1}$ _____ | 12. $\sqrt[3]{-1000}$ _____ |
| 13. $\sqrt[9]{-10,077,696}$ _____ | 14. $\sqrt[3]{-64}$ _____ |
| 15. $\sqrt[9]{-1}$ _____ | 16. $\sqrt[5]{100,000}$ _____ |
| 17. $\sqrt[5]{3125}$ _____ | 18. $\sqrt[3]{-27} \cdot \sqrt[3]{-64}$ _____ |
| 19. $\sqrt[7]{-1} + \sqrt[7]{-128}$ _____ | 20. $\sqrt[4]{2401}$ _____ |
| 21. $\sqrt[9]{-2^{18}}$ _____ | 22. $\sqrt[9]{2^{18}}$ _____ |

In 23–26, evaluate to the nearest hundredth, if possible.

- | | |
|-----------------------------|---------------------------|
| 23. $\sqrt[5]{-343}$ _____ | 24. $\sqrt[6]{-2}$ _____ |
| 25. $-\sqrt[8]{-345}$ _____ | 26. $-\sqrt[3]{32}$ _____ |

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SKILLS Objective D

In 27–30, simplify or rewrite with a smaller power of the variable inside the radical.

27. $\sqrt[3]{-8a^9}$ _____

28. $\sqrt[4]{32n^{13}}$ _____

29. $\sqrt[5]{-\frac{9}{x^{13}}} \cdot \sqrt[5]{-\frac{27}{x^{16}}}$ _____

30. $\sqrt[3]{49m^5n^2} \cdot \sqrt[3]{-21m^3n^7}$ _____

PROPERTIES Objective G31. a. **Multiple Choice** Which of the following is undefined? _____

A $\sqrt[5]{7776}$

B $\sqrt[4]{7776}$

C $\sqrt[5]{-7776}$

D $\sqrt[4]{-7776}$

b. Explain why your answer in Part a is undefined.

32. Under what condition does $\sqrt[n]{x^n} = x$ for all values of x ?

33. **True or False** If n is an even integer, $\sqrt[n]{x^n}$ is positive. _____

34. Enter each expression into a CAS and record the result.

a. solve $(x^5 = (x^{15})^{(1/3)}, x)$ _____

b. solve $(x^5 = (x^{10})^{(1/2)}, x)$ _____

c. Explain why the answers are different. _____
