# Radicals and Irrational Numbers

Square roots, radical simplification, estimation, and irrational-number fluency.

Name _____ Date _____

32 main | 2-up grid | 2 pages

**Completion Reward**

Shown here as a small pack artifact, not a preview destination.

**1. Evaluate sqrt(81). Answer with a number.**

**2. Evaluate sqrt(49). Answer with a number.**

**3. Evaluate sqrt(121). Answer with a number.**

**4. Between which two integers does sqrt(20) lie?**

A. 3 and 4
B. 5 and 6
C. 4 and 5
D. 2 and 3

**5. What is the diagonal of a 1-by-1 square?**

A. sqrt(2)
B. 2
C. 1
D. sqrt(3)

**6. Which number is irrational?**

A. -4
B. 0.75
C. 3/11
D. pi

**7. Which expression has a rational value?**

A. sqrt(49)
B. sqrt(11)
C. sqrt(3)
D. sqrt(19)

**8. Which number is irrational?**

A. sqrt(3)
B. 4
C. 0.25
D. -7

**9. What does sqrt(81) ask for?**

A. The positive number whose square is 81
B. Any number whose double is 81
C. The negative number whose square is 81 only
D. The sum of factors of 81

**10. Which number is irrational?**

A. 0.25
B. sqrt(7)
C. -3
D. 7/8

**11. What is sqrt(36)?**

A. 6 or -6
B. -6
C. 36
D. 6

**12. Which expression is equivalent to 3sqrt(5) + 2sqrt(5)?**

A. 5sqrt(10)
B. 6sqrt(5)
C. sqrt(25)
D. 5sqrt(5)

**13. Which value is rational?**

A. sqrt(64)
B. sqrt(7)
C. pi
D. sqrt(10)

**14. Which expression is equivalent to sqrt(32)?**

A. 8sqrt(2)
B. 2sqrt(8)
C. 4sqrt(2)
D. 16sqrt(2)

**15. Which decimal is closest to sqrt(45)?**

A. 6.7
B. 5.4
C. 7.5
D. 8.2

**16. What is the best next step to simplify sqrt(48)?**

A. Rewrite 48 as 16 * 3.
B. Add 4 and 8.
C. Turn it into sqrt(4 + 4 + 4 + 4).
D. Make the answer 4sqrt(12) immediately.

**17. What is the best first step to simplify sqrt(72)?**

A. Look for a large perfect-square factor inside 72.
B. Add 7 and 2 first.
C. Square 72 and then undo it.
D. Change it into 72sqrt(1).

**18. A student says sqrt(9 + 16) = sqrt(9) + sqrt(16). What is the issue?**

A. You should multiply 9 and 16 first.
B. You should subtract the roots instead.
C. You must always square the radicand first.
D. Square roots do not distribute over addition.

**19. A student says sqrt(2) + sqrt(3) = sqrt(5). What is the mistake?**

A. Unlike radicals do not combine by adding the radicands.
B. They should multiply the radicands instead.
C. They forgot to square both terms first.
D. The expression should simplify to 5sqrt(6).

**20. A student says sqrt(2) + sqrt(3) = sqrt(5). What is the mistake?**

A. They should multiply the radicands to get sqrt(6).
B. The square root does not distribute over addition like that.
C. They should subtract the radicands to get 1.
D. They forgot to square both radicals first.

**21. Which expression is equivalent to sqrt(4/9)?**

A. 2/3
B. 4/9
C. 2/9
D. 4/3

**22. Which expression is equivalent to sqrt(50)?**

A. 25sqrt(2)
B. 10sqrt(5)
C. 5sqrt(2)
D. sqrt(25)

**23. Which expression is equivalent to sqrt(72)?**

A. 8sqrt(2)
B. 6sqrt(2)
C. 12sqrt(2)
D. 6sqrt(3)

**24. Simplify sqrt(20). Answer with your final expression.**

**25.** **Simplify sqrt(45). Answer with your final expression.**

**26.** **Simplify 3sqrt(5) + 2sqrt(5). Answer with your final expression.**

**27.** **Simplify 7sqrt(2) - 4sqrt(2). Answer with your final expression.**

**28.** **Simplify sqrt(3) * sqrt(12). Answer with your final expression.**

**29.** **Simplify sqrt(72). Answer with your final expression.**

**30.** **Solve sqrt(x) = 9. Answer in the form x = ...**

**31.** **Which simplification is correct?**

A. sqrt(18) + sqrt(2) = sqrt(20)
B. sqrt(18) = 9sqrt(2)
C. sqrt(2)^2 = 4
D. sqrt(18) * sqrt(2) = sqrt(36) = 6

**32.** **Which student simplifies sqrt(18) correctly?**

A. Student A: sqrt(18) = sqrt(9 * 2) = 3sqrt(2).
B. Student B: sqrt(18) = sqrt(9) + sqrt(2) = 3 + sqrt(2).
C. Student C: sqrt(18) = 18sqrt(1).
D. Student D: sqrt(18) = 9sqrt(2).