

When you raise each side of an equation to a power, it is possible to introduce extraneous solutions. Therefore, it becomes very important that you check all solutions in the original equation. A correct solution will give a true statement. An extraneous solution will give a false statement.



Problem 4 Checking for Extraneous Solutions

What is the solution of $\sqrt{x+7} - 5 = x$?

$$\sqrt{5x-1} + 3 = x?$$

Solve. Check for extraneous solutions.

◆ See Problem 4.

26. $\sqrt{3x+7} = x-1$

27. $(5-x)^{\frac{1}{2}} = x+1$

28. $\sqrt{-3x-5} = x+3$

32. $\sqrt{x+7} + 5 = x$

33. $(x+3)^{\frac{1}{2}} - 1 = x$

34. $\sqrt{x+7} - x = 1$

35. $\sqrt{3x} = \sqrt{x+6}$

36. $(2x)^{\frac{1}{3}} = (x+5)^{\frac{1}{3}}$

37. $(7x+6)^{\frac{1}{2}} - (9+4x)^{\frac{1}{2}} = 0$

38. $\sqrt{3x+2} - \sqrt{2x+7} = 0$

39. $(x+5)^{\frac{1}{3}} - (5-2x)^{\frac{1}{3}} = 0$

40. $(x-2)^{\frac{1}{3}} - (28-2x)^{\frac{1}{3}} = 0$

If an equation contains two radical expressions (or two terms with rational exponents), isolate one of the radicals (or one of the terms), then eliminate it (or its rational exponent). Isolate the more complicated radical expression first. In the resulting equation, simplify the expressions before you eliminate the second radical.

**Problem 5 Solving an Equation With Two Radicals**

41. $\sqrt{2x+1} - \sqrt{x} = 1?$

42. $\sqrt{5x+4} - \sqrt{x} = 4?$

43. $\sqrt{5-x} - \sqrt{x} = 1$

44. $\sqrt{3x+1} - \sqrt{x+1} = 2$

45. $\sqrt{2x+6} - \sqrt{x-1} = 2$

46. $\sqrt{3-x} + \sqrt{x+2} = 3$