

Solving Radical Equations

How do we solve $x^2 = 6$? Solve for x .

Examples:

$$4x^{2/3} = 100$$

$$\sqrt[3]{x} - 4 = 0$$

$$\sqrt{(x-4)} = 6$$

$$\sqrt{4x-7} + 2 = 5$$

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

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

1. Solve the following equations. Find all **real** solutions only. Think about when there may be more than one solution (or no solutions).

a. $x^3 = 125$

b. $x^{2/3} = 4$

c. $(x+1)^{1/3} = -2$

d. $\frac{(x+1)^3}{9} = -3$

e. $(x-3)^{1/2} = 4$

f. $(x-3)^2 = -4$

g. $3(x-1)^{3/2} + 1 = 25$

h. $x^{-2} = 16$

i. $(2x-1)^{-1/2} + 1 = 4$

j. $(x-3)^{-1/2} = \frac{1}{5}$

k. $3(x-2)^2 + 5 = 29$

l. $|x| = 5$

m. $2|x - 3| - 1 = 9$

n. $\frac{1}{2}(x - 4)^{-3/2} = 4$

o. $x^{-2}(x^4 + x^3 - 6x^2) = 0$

p. $2x^{1/2}(x^{3/2} - 2x^{1/2} - 3x^{-1/2}) = 0$

q. $2\sqrt{x+4} - 3 = -7$

Answers:

1a. 5 b. 8, -8 c. -9 d. -4 e. 19 f. not real g. 5 h. $\frac{1}{4}$ i. $\frac{5}{9}$ j. 28
k. $2 \pm 2\sqrt{2}$ l. ± 5 m. -2, 8 n. $\frac{17}{4}$ o. 2, -3 p. 3, -1 q. no solution