

Find the value for the variable that makes the statement true. (SHOW WORK NEATLY)

1.  $8\sqrt{2x+3}-10=30$

2.  $2\sqrt{x+4}+9=1$

3.  $3\sqrt{4a}-5=13$

4.  $12=2\sqrt{2(x+1)}-4$

5.  $\sqrt[3]{2x+1}+2=5$

6.  $\sqrt[3]{2x}-10=-6$

**One Radical Basic Equation**

I. Isolate the Radical if possible.

Example

$$\begin{aligned} 3\sqrt{x+2}+4 &= 19 \\ -4 & \quad -4 \\ \hline 3\sqrt{x+2} &= 15 \\ \div 3 & \quad \div 3 \\ \hline \sqrt{x+2} &= 5 \end{aligned}$$

II. Square Both Sides

Example

$$\begin{aligned} (\sqrt{x+2})^2 &= (5)^2 \\ x+2 &= 25 \end{aligned}$$

III. Isolate the Variable

Example

$$\begin{aligned} x+2 &= 25 \\ -2 & \quad -2 \\ \hline x &= 23 \end{aligned}$$

IV. Must Verify the Solution  
(This is not optional some solutions are extraneous.)

Example

$$\begin{aligned} 3\sqrt{(23)+2}+4 &= 19 \\ 3\sqrt{25}+4 &= 19 \\ 3(5)+4 &= 19 \\ 15+4 &= 19 \\ 19 &= 19 \quad \checkmark \end{aligned}$$

Find the value for the variable that makes the statement true. (SHOW WORK NEATLY)

7.  $\sqrt{5x+2} = \sqrt{3x+12}$

8.  $2\sqrt{x-5} = \sqrt{3x+2}$

9.  $2\sqrt{5x-4} = 3\sqrt{x+8}$

10.  $2\sqrt[3]{5x-3} = \sqrt[3]{35x+6}$

11.  $x+3 = \sqrt{15+x}$

**Two Radical Basic Equation**

**I. Square Both Sides**

Example  $\sqrt{5x+2} = 3\sqrt{x-2}$   
 $(\sqrt{5x+2})^2 = (3\sqrt{x-2})^2$   
 $5x+2 = 9(x-2)$

**II. Eliminate Parenthesis**

Example  $5x+2 = 9(x-2)$   
 $5x+2 = 9x-18$

**III. Move variables to one side and constants to the other**

Example  $5x+2 = 9x-18$   
 $-5x \quad -5x$   
 $2 = 4x-18$   
 $+18 \quad +18$   
 $20 = 4x$

**IV. Divide both sides by the coefficient**

Example  $\frac{20}{4} = \frac{4x}{4}$   
 $5 = x$

**V. Must Verify the Solution**  
 (This is not optional some solutions are extraneous.)

Example  $\sqrt{5(5)+2} = 3\sqrt{(5)-2}$   
 $\sqrt{25+2} = 3\sqrt{3}$   
 $\sqrt{27} = 3\sqrt{3}$   
 $3\sqrt{3} = 3\sqrt{3}$  ✓

Find the value for the variable that makes the statement true. (SHOW WORK NEATLY)

12.  $x - 1 = \sqrt{5x - 9}$

13.  $2x + 1 = \sqrt{11 - 2x}$

Find the values for the variable that make the inequality statement true. (SHOW WORK NEATLY)

14.  $\sqrt{3x + 3} \leq 6$

15.  $-2\sqrt{x + 1} < -8$

16.  $\sqrt{2x + 1} \geq -4$



17.  $9 \geq 5 + \sqrt{x - 2}$



18.  $\sqrt[3]{4x - 1} \leq 3$

