

Solving Radical Equations

Solve each equation. Remember to check for extraneous solutions.

$1.) \begin{array}{r} 15 = 9 + \sqrt{x} \\ -9 \quad -9 \\ \hline (6)^2 = (\sqrt{x})^2 \end{array}$ $X = 36$	$2.) \begin{array}{r} \sqrt[4]{n+8} - 6 = -3 \\ +6 \quad +6 \\ \hline (\sqrt[4]{n+8})^4 = (3)^4 \\ \frac{n+8}{-8} = \frac{81}{-8} \end{array}$ $n = 73$
$3.) \begin{array}{r} (\sqrt{3z+4})^2 = (5)^2 \\ 3z+4 = 25 \\ -4 \quad -4 \\ \hline 3z = 21 \\ \frac{3z}{3} = \frac{21}{3} \end{array}$ $z = 7$	$4.) \begin{array}{r} \sqrt{p-3} + 6 = 5 \\ -6 \quad -6 \\ \hline (\sqrt{p-3})^2 = (-1)^2 \\ p-3 = 1 \\ \frac{p-3}{+3} = \frac{1}{+3} \end{array}$ <p>$p = 4$ extraneous solution ↓ No Solution</p>
$5.) \begin{array}{r} (3)^3 = (\sqrt[3]{x-2})^3 \\ 27 = x-2 \\ +2 \quad +2 \\ \hline X = 29 \end{array}$	$6.) \begin{array}{r} 2\sqrt[5]{6m-4} - 1 = 3 \\ +1 \quad +1 \\ \hline 2\sqrt[5]{6m-4} = 4 \\ \frac{2\sqrt[5]{6m-4}}{2} = \frac{4}{2} \\ (\sqrt[5]{6m-4})^5 = (2)^5 \\ \frac{6m-4}{+4} = \frac{32}{+4} \\ 6m = 36 \\ \frac{6m}{6} = \frac{36}{6} \\ m = 6 \end{array}$
$7.) \begin{array}{r} (\sqrt{5w+3})^2 = (\sqrt{4w+5})^2 \\ 5w+3 = 4w+5 \\ -4w \quad -3 \quad -4w \quad -3 \\ \hline w = 2 \end{array}$	$8.) \begin{array}{r} -5\sqrt{x+4} = 45 \\ -5 \quad -5 \\ \hline (\sqrt{x+4})^2 = (-9)^2 \\ x+4 = 81 \\ \frac{x+4}{-4} = \frac{81}{-4} \end{array}$ <p>$x = 77$ extraneous ↓ No Solution</p>
$9.) \begin{array}{r} (4w)^3 + 3 = 5 \\ -3 \quad -3 \\ \hline ((4w)^3)^{1/3} = (2)^3 \\ \frac{4w}{4} = \frac{8}{4} \end{array}$ $w = 2$	$10.) \begin{array}{r} x^{3/2} + 2 = 10 \\ -2 \quad -2 \\ \hline (x^{3/2})^{2/3} = (8)^{2/3} \\ X = 4 \end{array}$
$11.) \begin{array}{r} 3n^5 - 81 = 15 \\ +81 \quad +81 \\ \hline \frac{3n^5}{3} = \frac{96}{3} \\ (n^5)^{1/5} = (32)^{1/5} \end{array}$ $n = 8$	$12.) \begin{array}{r} 2(m-10)^3 + 9 = 5 \\ -9 \quad -9 \\ \hline \frac{2(m-10)^3}{2} = \frac{-4}{2} \\ ((m-10)^3)^{1/3} = (-2)^3 \\ m-10 = -8 \\ \frac{m-10}{+10} = \frac{-8}{+10} \\ m = 2 \end{array}$