

**5.4 Solving Radical Equations & Inequalities CYU**

Use when you get it right all by yourself  
*S* Use when you did it all by yourself, but made a silly mistake  
*H* Use when you could do it alone with a little help from teacher or peer  
*G* Use when you completed the problem in a group  
*X* Use when a question was attempted but wrong (get help)  
*N* Use when a question was not even attempted

CONCEPTS	BASIC	INTERMEDIATE	ADVANCED
Solving radical equations	1	2	3, 6
Checking solutions	1 - 3	6 - 11	
Real-world application	4	5	4
Solving equations with two radicals		7	8
Solving equations with rational exponents	9	10	11
Solving radical inequalities	12	13	14

Solve the equation. Check your solution.

1.  $\sqrt[3]{x - 16} = 2$

$x = 24$

2.  $\sqrt[3]{x} - 10 = -7$

$x = 27$

3.  $\sqrt{2x} - \frac{2}{3} = 0$

$x = \frac{2}{9}$

4. **MODELING WITH MATHEMATICS** Biologists have discovered that the shoulder height  $h$  (in centimeters) of a male Asian elephant can be modeled by  $h = 62.5\sqrt[3]{t} + 75.8$ , where  $t$  is the age (in years) of the elephant. Determine the age of an elephant with a shoulder height of 250 centimeters.



$\approx 21.7 \text{ years}$

5. **MODELING WITH MATHEMATICS** In an amusement park ride, a rider suspended by cables swings back and forth from a tower. The maximum speed  $v$  (in meters per second) of the rider can be approximated by  $v = \sqrt{2gh}$ , where  $h$  is the height (in meters) at the top of each swing and  $g$  is the acceleration due to gravity ( $g \approx 9.8 \text{ m/sec}^2$ ). Determine the height at the top of the swing of a rider whose maximum speed is 15 meters per second.

$\approx 11.5 \text{ m}$

Solve the equation. Check your solution.

6.  $\sqrt{44 - 2x} = x - 10$

$x = 14$

7.  $\sqrt{3x - 3} - \sqrt{x + 12} = 0$

$x = 7.5$

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

$x = \frac{1}{4}$  or  $0.25$

Solve the equation. Check your solution.

9.  $2x^{\frac{2}{3}} = 8$

$x = \pm 8$

10.  $(5 - x)^{\frac{1}{2}} - 2x = 0$

$x = 1$

11.  $(5x^2 - 4)^{\frac{1}{4}} = x$

$x = 1, 2$

Solve the inequality.

12.  $2\sqrt{x} + 3 \leq 8$

$[0, \frac{25}{4}]$

13.  $\sqrt[3]{x + 7} \geq 3$

$[20, \infty)$

14.  $-0.25\sqrt{x} - 6 \leq -3$

$[0, \infty)$

**CYU Reflection:** How far can you go: basic, intermediate, or advanced?

**Rate your mastery level!**

How confident are you with the skills this CYU covered? Circle the score you would give yourself.

