

Algebra II  
Exponents #6

Name \_\_\_\_\_

Solve the following equations. Remember to always check your solution(s) (beware of extraneous solutions!!!!).

1.  $\sqrt{5x+1} = 6$

2.  $8\sqrt[3]{10x} - 15 = 17$

3.  $\sqrt[4]{4x} - 13 = -15$

4.  $x - 6 = \sqrt{3x}$

5.  $\sqrt{2x+30} = x+3$

6.  $\sqrt{4x+1} = \sqrt{x+10}$

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

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

9.  $(x+6)^{\frac{1}{2}} = x$

10.  $(5x^2 - 4)^{\frac{1}{4}} = x$

11. 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.

12. 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 ( $g = 9.8 \text{ m/sec}^2$ ). Determine the height at the top of the swing of a rider whose maximum speed is 15 meters per second.