

**Practice Problems for Exponents, Roots, and Logarithms**  
from [www.topmath.info](http://www.topmath.info)

1 What can  $x$  be, if  $x^4 - 81 = 0$ ?

2 A number,  $p$ , has 6 subtracted from it to produce a second number. The cube root of the second number is  $-0.9$ . What is  $p$ ?

3 A number,  $t$ , has 21 subtracted from it to produce a second number. The fifth root of the second number is  $-0.4$ . What is  $t$ ?

4 A number,  $t$ , has 20 subtracted from it to produce a second number. The cube root of the second number is  $0.6$ . What is  $t$ ?

5 A number,  $x$ , has 21 subtracted from it to produce a second number. The fifth root of the second number is  $0.1$ . What is  $x$ ?

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6 What is the square root of 1?

7 What is the cube root of 1,000?

8 What is the cube root of 3,375?

9 The logarithm base 4 of 1020 is closest to what integer?

10 (T/F): If  $x^2 > y^2$ , then  $x > y$ .

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11 Suppose  $qx^{-1} = 4$ . What is  $q$ ?

12 What is 15 squared?

13 What is 35 squared?

14 What is 40 cubed?

15 What can  $x$  be, if  $x^3 + 125 = 0$ ?

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1 ANSWER: -3 or 3. EXPLANATION: The fourth root of a number is the square root of the square root of the number. The square root of 81 is 9, and the square root of 9 is 3. Since the exponent (4) is even, both the positive and negative roots are correct answers.

2 ANSWER: 5.271. EXPLANATION: The second number is -0.9 cubed, or -0.729. This is 6 less than p, so we add to get the answer.

3 ANSWER: 20.98976. EXPLANATION: The second number is -0.4 to the fifth power, or -0.01024. This is 21 less than t, so we add to get the answer.

4 ANSWER: 20.216. EXPLANATION: The second number is 0.6 cubed, or 0.216. This is 20 less than t, so we add to get the answer.

5 ANSWER: 21.00001. EXPLANATION: The second number is 0.1 to the fifth power, or 0.00001. This is 21 less than x, so we add to get the answer.

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6 ANSWER: 4

7 ANSWER: 729

8 ANSWER: 9261

9 ANSWER: 5. EXPLANATION: Note that  $4^5 = 1024$ , and no other integer power of 4 is anywhere near as close to 1020.

10 ANSWER: False. EXPLANATION: It is possible that  $x$  is negative and  $y$  is positive.

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11 ANSWER:  $4x^1$ . EXPLANATION: The expression  $x^{-1}$  means  $1/(x^1)$ . If we multiply this by  $x^1$ , the two cancel each other, and we need only multiply by 4 to equal the number on the right side of the equation.

12 ANSWER: 225

13 ANSWER: 1,225

14 ANSWER: 64,000

15 ANSWER: -5. EXPLANATION: The number whose cube is 125 is 5. Because  $x^3$  must be negative,  $x$  must also be negative.