# Practice Test for Exponential and Logarithmic Functions Unit

**Learning Objectives:**

1. Simplify rational exponents.
2. Rewrite a root as a rational exponent.
3. Use rational exponents to rewrite an expression in simplest radical form.
4. Simplify real number exponents
5. Solve an equation with rational exponents.
6. Write a function to model an exponential situation.
7. Use an exponential model to answer questions about a real life situation.
8. Identify the major features of an exponential graph: y-intercept, asymptote, domain and range.
9. Graph an exponential growth or decay function.
10. Use transformations to sketch the graph of an exponential function.
11. Identify how the base of an exponential function affects the shape of the graph.
12. Transform a logarithm to an exponent and an exponent to a logarithm.
13. Simplify a logarithm.
14. Solve an exponential equation by converting it into a logarithm.
15. Solve a logarithmic equation by converting it into an exponent.
16. Identify the major features of an logarithmic graph: x-intercept, asymptote, domain and range.
17. Graph a logarithmic function.
18. Use the compound interest formula to answer questions about interest.
19. Use the continuous growth or decay function to model a real life situation.

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| **Question #** | **Learning Objective** | **Know It** | **Feel Unsure** |  | **Right** | **Wrong** | **Simple Mistake** | **Need to Study** |
| 1 | A |  |  |  |  |  |  |  |
| 2 | B |  |  |  |  |  |  |  |
| 3 | C |  |  |  |  |  |  |  |
| 4 | D |  |  |  |  |  |  |  |
| 5 | E |  |  |  |  |  |  |  |
| 6 | E |  |  |  |  |  |  |  |
| 7 | F |  |  |  |  |  |  |  |
| 8 | G |  |  |  |  |  |  |  |
| 9 | H, I |  |  |  |  |  |  |  |
| 10 | H, I |  |  |  |  |  |  |  |
| 11 | J |  |  |  |  |  |  |  |
| 12 | K |  |  |  |  |  |  |  |
| 13 | L |  |  |  |  |  |  |  |
| 14 | M |  |  |  |  |  |  |  |
| 15 | N |  |  |  |  |  |  |  |
| 16 | O |  |  |  |  |  |  |  |
| 17 | P, Q |  |  |  |  |  |  |  |
| 18 | R |  |  |  |  |  |  |  |
| 19 | S |  |  |  |  |  |  |  |

1. Simplify: $32^{-\frac{4}{5}}$ 2. Rewrite as an exponent: $\sqrt[4]{2x^{6}y^{8}}$ 3. Rewrite in simplest radical form: $\sqrt[4]{27}∙\sqrt[3]{81}$

4. Simplify: $3^{3π-1}∙3^{π+4}$ 5. Solve: $x^{\frac{2}{5}}+5=14$ 6. Solve: $36^{x}=\frac{1}{\sqrt{6}}$

7. A mouse population is 10,000. It is decreasing at a rate of 20% per year. How many will be left in 2 years?

8. In problem #7, when will the population be half the original size?

9. Graph this function using two majors points: $f\left(x\right)=5^{x}$ Identify the domain, range, y-intercept and asymptote.

10. Graph this function using two majors points: $f\left(x\right)=\left(\frac{1}{3}\right)^{x}$ Identify the domain, range, y-intercept and asymptote.

11. Given the function: $f\left(x\right)=\left(\frac{1}{3}\right)^{x}$, find $f\left(x\right)=-\left(\frac{1}{3}\right)^{x-4}+7$.

12. Explain how making *b* in $f\left(x\right)=b^{x}$ larger or smaller changes the shape of the graph. What values cannot be *b*?

13. a) Convert to a logarithm: $5^{\frac{1}{2}}=\sqrt{5}$0, b) Convert to an exponent: $log\_{11}1=0$ 14. Simplify $Log\_{9}27 $

15. Solve: $5^{x-1}=100$ 16. Solve: $log\_{x}20=3$

17. Graph this function using two majors points: $f\left(x\right)=log\_{7}x$ Identify the domain, range, y-intercept and asymptote.

18. I invest $7500into an account that gets 5% interest compounded monthly. When will I double my money?

19. An adult takes 400 mg of ibuprofen. Each hour, the amount of ibuprofen in the person’s system decreases

by about 29%. How much ibuprofen is left after 6 hours?