# Math 30-1 Unit 3 Exponents and Logarithms Review Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Determine the following characteristics of the graph of 

 Domain

 Range

 Equation of the asymptote

 Coordinates of the *y*-intercept

1. Given  and its inverse.
2. Complete the table of values for each

 

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| -2 |  |  |  |  |
| -1 |  |  |  |  |
| 0 |  |  |  |  |
| 1 |  |  |  |  |
| 2 |  |  |  |  |

1. Sketch .
2. If sketch 
3. Given 

 a) Determine the following characteristics

 Domain

 Range

 Equation of the asymptote

 Coordinates of the *x*-intercept

 b) If  what is the *x*-intercept of ?

1. The point (1, 0) is on the graph of . Determine the coordinates of the image point after the graph has been translated according to the equation .
2. Describe in words the transformations required to transform the graph of  to the graph of .
3. Determine the value of *a* for which the graph of  is a horizontal line.
4. Determine the value of *b* for which the graph of  is a horizontal line.
5. Describe the effect on the graph of an exponential function if the value of b changes from 3 to 1/3.
6. The point (6, 4) lies on the graph of *y*  log*b* *x*. Determine the value of *b* to the nearest tenth.
7. Express each in logarithmic form.

 a)  b) 

1. Express each in exponential form

 a)  b) 

1. Solve algebraically.

 a)  b) 

 c)  d) 

1. Simplify and then evaluate each expression, round to four decimal places if necessary.

 a)  b) 

 c)  d) 

 e)  f) 

1. Express  in terms of *x* given 

1. Given , evaluate .
2. Using the equation log27 *x*  *y*, what would the expression log9 *x* equal?
3. If log3 5  *x*, express  in terms of *x*.
4. For each of the following, solve for *x*. Remember to list the domain.

a)  b) 

c)  d) 

1. Solve for the value of the variable. 
2. A bacteria culture starts with 5000 bacteria. After 6 hours, the estimated count is 80,000. What is the doubling period for this bacteria culture?
3. The population of a city is increasing at a constant rate of 5% per year. The city’s present population is 200 000. Determine the minimum number of years it will take for the population to exceed 500 000.
4. The pH of lemon juice is 2.3 while the pH of milk is 6.6. Determine the concentration of hydrogen ions in each substance using the formula . Which substance is more acidic?
5. The concentration of hydrogen ions in apple juice can be written as . Use the formula  to determine the pH of apple juice.
6. In 1812, an earthquake of magnitude 7.9 shook New Madrid, Missouri. How many times more intense was the New Madrid earthquake compared to the 2001 earthquake of magnitude 3.2 in Charlottesville, Virginia? 
7. Scientists have found that the sensation of loudness can be described using a logarithmic scale. The intensity level, in decibels, of a sound is defined as  , where I is the intensity of the sound, in watts per square metre and Io is 10-12 W/m2, corresponding to the faintest sound that can be heard by a person of normal hearing. What is the measure of the loudness, in decibels of a hair dryer that has an intensity of 10-5?
8. One brand of ear plugs claims to block the sound of snoring as loud as 22 dB. A second brand claims to block snoring that is eight times as intense. If the claims are true, for how many more decibels is the second brand effective? 

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