U4D9 Review: Exponents and Exponential Functions

A: Exponent Laws & Exponential Expressions

1) Evaluate.

$$\left(\frac{5}{7}\right)^{-2}$$

2) Rewrite in radical form and then evaluate.

$$(-64)^{-\frac{2}{3}}$$

3) Simplify and rewrite using positive exponents.

$$\frac{(2x^{-5}y^{3})^{2}(-6x^{4}y^{-1})}{3xy^{-7}}$$

4) Rewrite in radical form and simplify.

$$\left(\sqrt[6]{27a^{3}b^{4}}\right)^{2}$$

5) Solve.

$$3^{2k} = 243$$

B: Exponential Functions

1. List the transformations in the order they must be applied.

$$f(x) = -\left(\frac{1}{3}\right)^{\left(\frac{1}{4}x+1\right)} - 1$$

2. Identify each table of values as linear, quadratic, or exponential. Show calculations to help explain/support your answer. For the exponential function(s) state whether it is growth or decay AND determine the equation.

x	y
--2	5.75
-1	5.3
0	4.85
1	4.4
2	3.95

x	y
-2	5.0625
-1	5.25
0	6
1	9
2	21

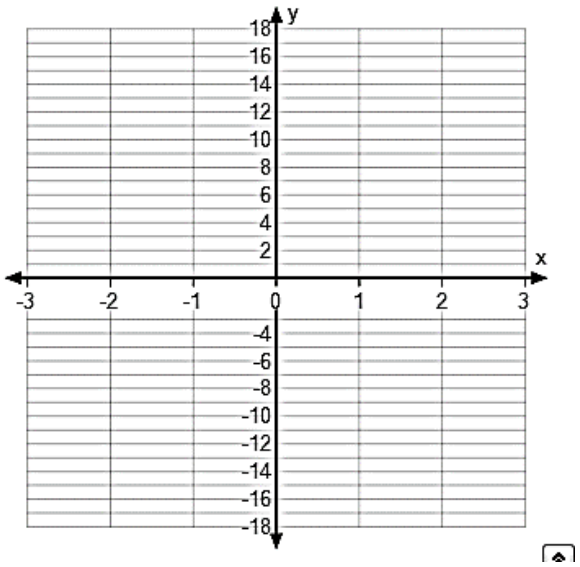
3. For $g(x) = \frac{1}{2}(4)^{-x} + 2$

State the base/parent function

State the transformations in the order that they that must be applied

State the x and y-intercepts, and the equation of the asymptote

Graph the new function



State the domain and range

D:

R:

Is the function increasing or decreasing?

4. The town of Vanessa is growing exponentially at a rate of 4.5% each year.

a) If the population of Vanessa is now 15 000, how many people will be living there in 42 months?

b) How many years would it take for the population to quadruple? (accurate to nearest tenth of a year)

5. A 500g sample of plutonium-243 has a half-life of 12 days.

a) Determine an equation to model this situation.

b) Determine how many grams of plutonium-243 remain after 6 weeks.

c) Determine how long it would take for only one-quarter of the original sample to remain. (accurate to the nearest day)