Algebra 2 CC Name _____
Logarithms Review 2020 (snow day)

Solve algebraically for all values of x, round to the ***nearest ten-thousandth***.

1.) $3^x = 11$

2.) $2(5)^x = 12$

3.) $2e^x - 1 = 3$

4.) $4 + 6e^{0.14x} = 783$

5.) $8(2^{x+3}) = 48$

6.) Sean invests $8,000 at an annual rate of 4% ***compounded continuously***.

Determine how many years, to the *nearest year*, it will take for his initial investment to **triple**.

8.) Rachel deposited $2,000 at 7% annual interest, **compounded monthly**.

In how many years, to the *nearest tenth* of a year, will she have $5,500 in her account?

9.) Environmentalist in Ireland ae concerned about the leprechaun population since the number of rainbows seen in a year has been steadily decreasing. Since leprechauns live at the base of rainbows, a decrease in the number of rainbows in a year will be detrimental to the survival of the leprechauns. Currently, the number of leprechauns in Ireland is 100. The number of leprechauns has been decreasing by **half** every 15 years. Find to the ***nearest tenth of a year***, when it is expected to only have 10 leprechauns remaining?

10.) What is the **inverse** of the function $y = \log_4 x$?

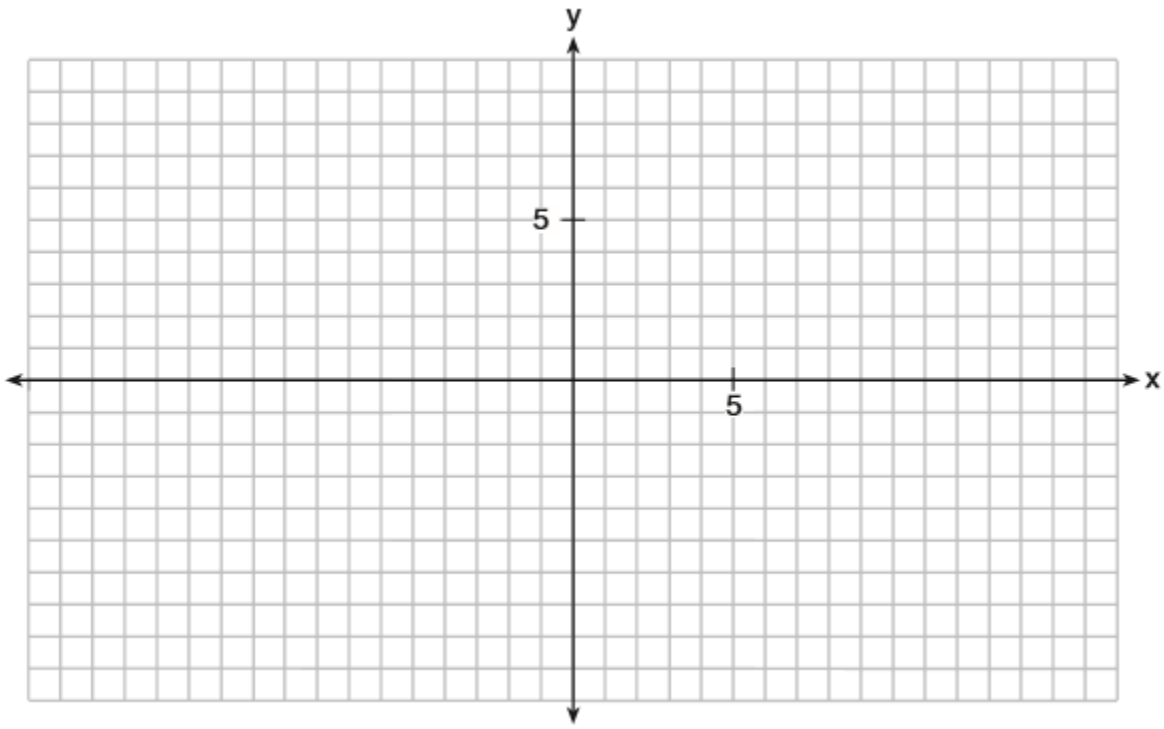
(a) $y = x^4$ (b) $x = y^4$ (c) $y = 4^x$ (d) $x = 4^y$

11.) If $f(x) = a^x$ where $a > 1$, then the inverse of the function is

(a) $f^{-1}(x) = \log_x a$ (c) $f^{-1}(x) = \log_a x$

(b) $f^{-1}(x) = a \log x$ (d) $f^{-1}(x) = x \log a$

12.) On the grid below, graph the function: $y = \log_3(x-2)-1$



b. Graph and state the equation of the asymptote.

c. State the domain of the graph.

13.) Jeff puts \$2000 in an investment account with interest that is ***compounded continuously***.

Find the annual percent of increase that is needed for the account to grow to \$5000 after 20 years.

[Round to the nearest percent]

14.) The Fahrenheit temperature, $F(t)$, of a heated object at time t, in minutes, can be modeled by the function below. F_s is the surrounding temperature, F_0 is the initial temperature of the object, and k is a constant. $F(t) = F_s + (F_0 - F_s)e^{-kt}$

Coffee at a temperature of $185^\circ F$ is poured into a container. The room temperature is kept at a constant $68^\circ F$ and $k = 0.04$. Coffee is safe to drink when its temperature is, at most, $115^\circ F$. To ***the nearest minute***, how long will it take until the coffee is safe to drink?

15.) For which values of x, rounded to the ***nearest tenth***, will $\log(x-3) = |x| - 6$?

16.) For which values of x, rounded to the ***nearest hundredth***, will $\log_4(x)+5=\left|x^2-3\right|$?

17.) The Fahrenheit temperature, $F(t)$, of a heated object at time t, in minutes, can be modeled by the function below. F_s is the surrounding temperature, F_0 is the initial temperature of the object, and k is a constant. $F(t)=F_s+(F_0-F_s)e^{-kt}$

Coffee at a temperature of $190^\circ F$ is poured into a container. The room temperature is kept at a constant $68^\circ F$ and $k=0.06$. Coffee is safe to drink when its temperature is, at most, $120^\circ F$. To ***the nearest minute***, how long will it take until the coffee is safe to drink?