

EVHS Math 3

Unit 3 Review

(10 Points)

Show all work neatly organized that leads to the solution in order to receive full credit. Be sure to simplify, check, and box your answers. (Multiple Choice: 1pt each & Free Response: 3pt each)

- 1 Simplify the expression.

$$\frac{12e^5}{36e^2}$$

- 2 Tell whether the function represents **exponential growth** or **exponential decay**.

$$y = 4e^{-2x}$$

- A Exponential Growth
B Exponential Decay

- 3 Rewrite the logarithmic function **in its exponential form**.

$$\log_{32} 4 = \frac{2}{5}$$

- 4 Write the exponential function **in its logarithmic form**.

$$3^5 = 243$$

- 5 Evaluate the logarithm **WITHOUT a CALCULATOR**.

$$\log_6 216$$

- 6 Describe the **transformation of f to g** .

$$f(x) = \log_5 x, \quad g(x) = \log_5(x - 5) - 2$$

- A Left 5, up 2
B Left 5, down 2
C Right 5, up 2
D Right 5, down 2

- 7 Simplify the expression.

$$10^{\log 2x}$$

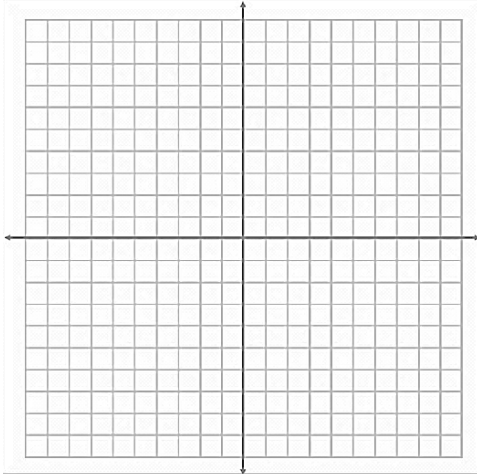
- 8 Find the **inverse** of the function.

$$y = 10^x - 2$$

- 9] **Make a table** to sketch the **graph of $f(x)$** by hand. Then use the graph of $f(x)$ to sketch the **graph of $g(x)$** & **find any asymptotes** of the graphs.

$$f(x) = 2^x - 3$$

$$g(x) = \log_2(x + 3)$$



- 10] You deposit \$400 in an account that pays 5% annual interest. **How long will it take for the balance to double** for each frequency of compounding?

a. *annually*:

b. *quarterly*:

c. *daily*:

d. *continuously*:

- 11] **ALGEBRAICALLY solve** the equation for “ x ”.

$$5^{x-3} + 7 = 632$$

- 12] **ALGEBRAICALLY solve** the equation for “ x ”.

$$\log_3(x + 2) = 2$$

- 13] Use the change of base formula to **rewrite the logarithm in base 93**.

$$\log_{14} 10$$

- 14] **ALGEBRAICALLY solve** the equation for “ x ” & **verify your result(s)**.

$$\log(x^2 + 11) - \log(x + 3) = \log 6$$

- 15] **Solve for x** in the equation $9^{4x-5} = 243^{x+4}$.

- 16] **EXPAND the expression** using the properties of logarithms.

$$f(x) = \log \frac{b^{10} n^{14}}{f^{93}}$$

- 17 **CONDENSE the expression** using the properties of logarithms.

$$f(x) = 5 \log_{19} m + 17 \log_{19} j - 91 \log_{19} f$$

- 18 Use $\log_3 4 \approx 1.262$ and $\log_3 5 \approx 1.465$ to **evaluate** each logarithm.

- $\log_3 \frac{4}{5}$
- $\log_3 20$
- $\log_3 100$

- 19 Use *Newton's Law of Cooling*,

$$T = (T_0 - T_R)e^{-rt} + T_R$$

to answer the question below:

Your sister is cooking her famous chili. When she takes it off of the stove, its temperature is 212°F . The room temperature is 75°F , and the cooling rate of the chili is $r = 0.051$. **How long will it take to cool the chili to a serving temperature of 95°F ?**

- 20 **Write an exponential function** $y = ab^x$ whose graph passes through $(1, 10)$ and $(3, 40)$.

- 21 The table shows the height h (in feet) of a tree at specific ages t (in years). Use a graphing calculator to find a logarithmic model of the form $h = a + b \ln t$ that represents the data. Estimate the height when the

Age, t	1	3	5	9	11	13
Height, h	3.5	11	15.5	22	24	24.75