Name: _____   Student #:_____

Date:_____   T.A. #:_____

Mathematics 12 Pre-Calculus
LEARNING GUIDE 13 TEST
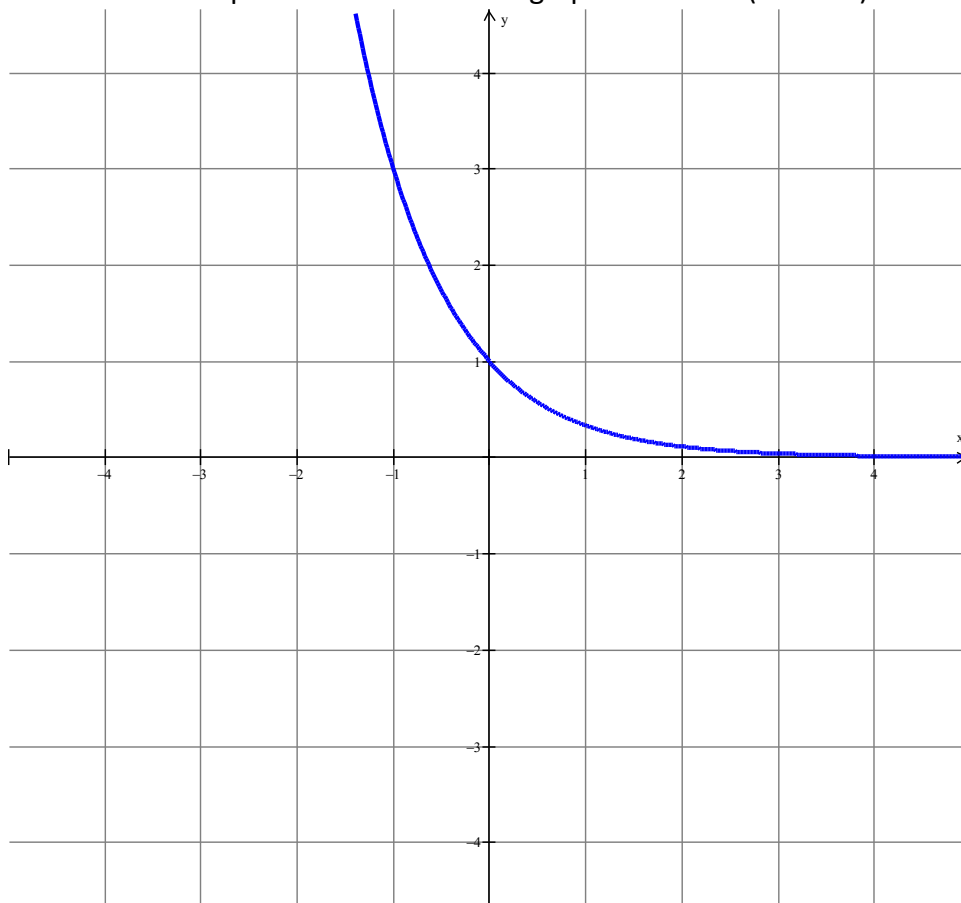## EXPONENTIAL FUNCTIONS & EQUATIONS

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GRAPHING CALCULATORS ARE NOT PERMITTED ON THIS TEST
*Full marks will NOT be given for the final answer only.

When using a calculator, you should provide a decimal answer that is correct **to at least two decimal places** (unless otherwise indicated). Such rounding should occur **only** in the final step of the solution.

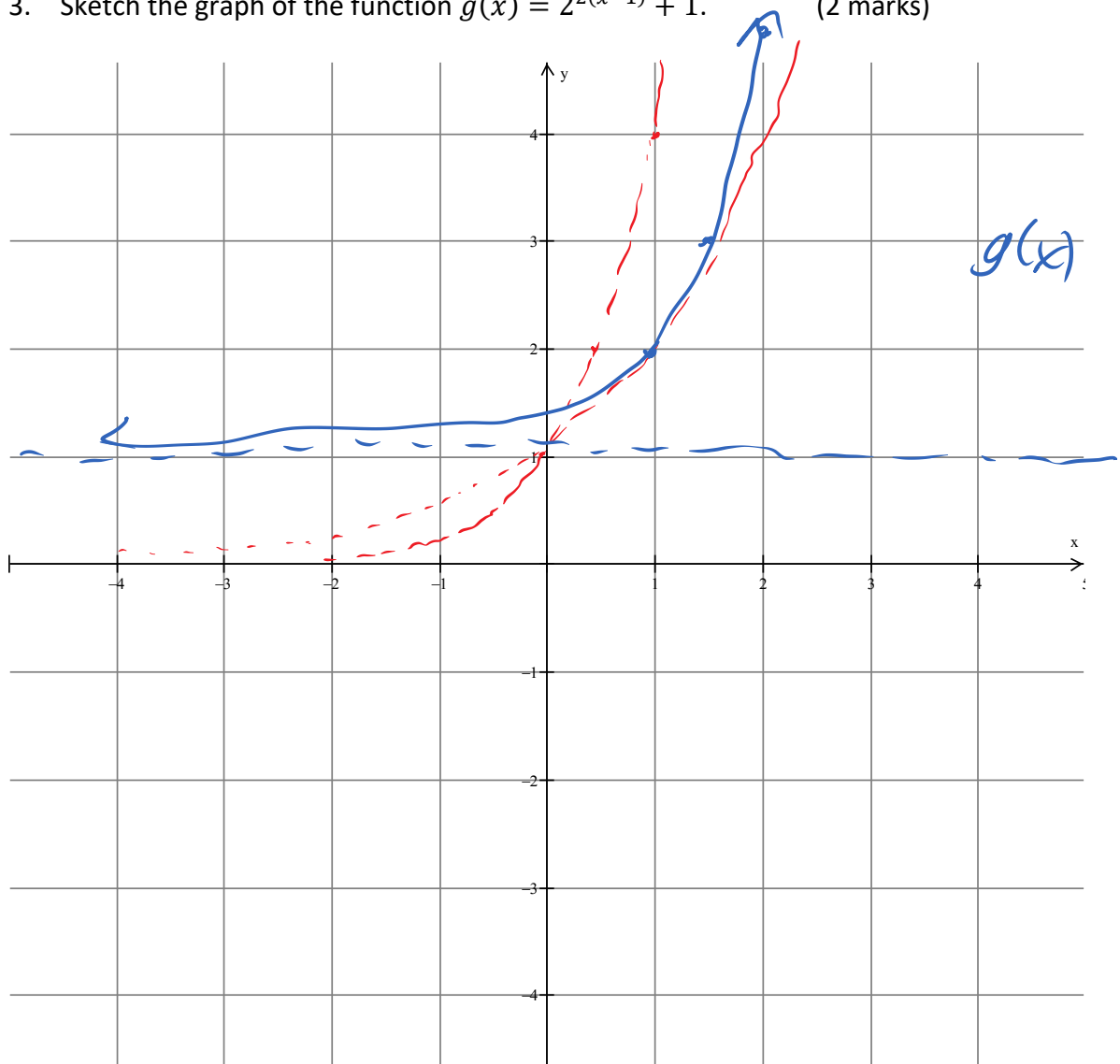1. Determine the equation of the function graphed below. (2 marks)

$$y = \frac{1}{3}^{x}$$

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2. What transformations were applied to the function $f(x) = 2^x$ to generate the function $g(x) = 2^{2(x-1)} + 1$? (3 marks)

HC BAF $\frac{1}{2}$

RIGHT 1

NP 1

3. Sketch the graph of the function $g(x) = 2^{2(x-1)} + 1$. (2 marks)

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4. What is the domain and range of the function $y = a^{(bx)} - c$ where a, b, c are positive real numbers. (2 marks)

$$x \in R$$

$$y > -c$$

5. Solve each exponential equation (3 marks each).

a) $25^{x+1} = 5^{-2x}$

$$5^{2(x+1)} = 5^{-2x}$$

$$2x + 2 = -2x$$

$$4x = -2 \qquad x = -\frac{1}{2}$$

b) $9^{2x} = 27^{x+2}$

$$3^{2(2x)} = 3^{3(x+2)}$$

$$4x = 3x + 6$$

$$x = 6$$

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