May 2020 Unit 7 Extra Credit Assignment Name:_____

Logarithmic Functions

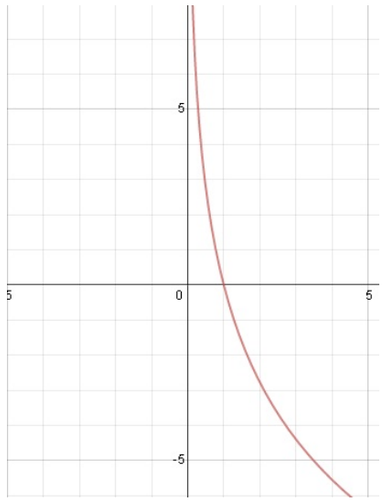
Circle the best answer. 2 marks each

1 What is the end behavior of the graph y = log x?

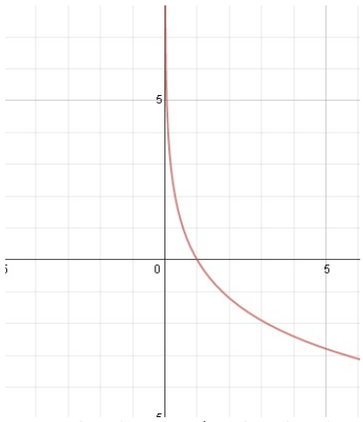
A. curve extends from quadrant I to quadrant II
B. curve extends from quadrant I to quadrant IV
C. curve extends from quadrant IV to quadrant I
D. curve extends from quadrant II to quadrant I

2 Which graph below represents the graph of y = 4 ln (x)?

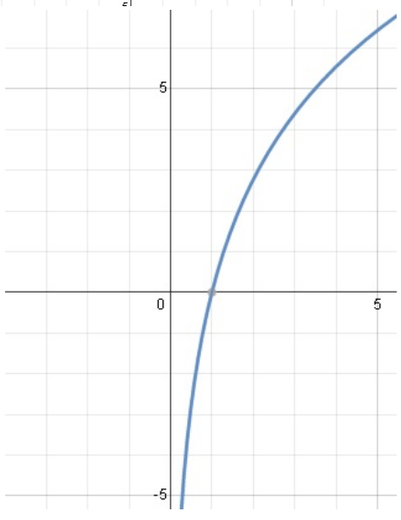
A)



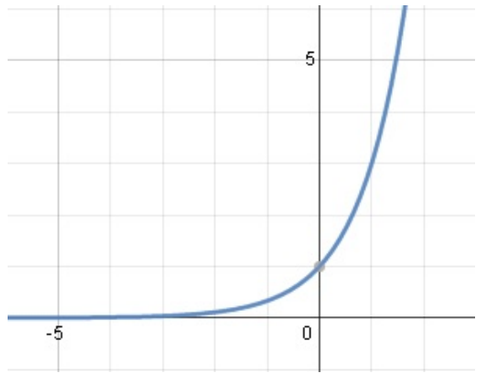
B)



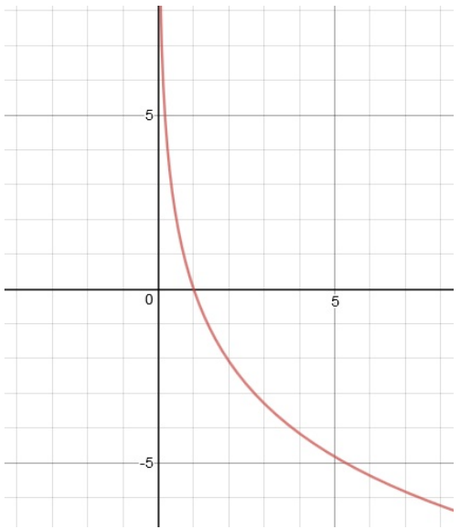
C)



D)



3 Which is a possible equation for the graph displayed below?



A) $y = 7(.5)^x$

B) $y = 7(2)^x$

C) $y = 2\log_{10} x$

D) $y = -2\ln x$

4 What is the logarithmic form of $2^{-5} = \frac{1}{32}$?

A) $\log_2 -5 = \frac{1}{32}$

B) $\log_2 \frac{1}{32} = -5$

C) $\log_5 2 = \frac{-1}{32}$

D) $\log_5 \frac{1}{32} = -2$

5 What is the exponential form of $\log_5 125 = 3$?

A) $5^3 = 125$

B) $5^{125} = 3$

C) $3^5 = 125$

D) $125^3 = 5$

6 What is the value of log 1400 to three decimal places?

A) 2.146
B) 3.146
C) 4.146
D) 7.244

7 Evaluate as a rational number $\log_6 \frac{1}{36}$

A) -6
B) -3
C) -2
D) 2

8 Express in exponential form: ln 8 = 2.08

A) $2^e = 8$

B) $8^e = 2.08$

C) $e^2 = 8$

D) $e^{2.08} = 8$

9 Write as a single logarithm.

$\log_3 64 - 2\log_3 4$

A) $\log_4 16$

B) $\log_4 4$

C) $\log_3 16$

D) $\log_3 4$

10 Find the value of $\log_3 2000$ to 2 decimal places.

A) 2.82
B) 6.92
C) 6.93
D) 6.50

11 Solve for x:

$2 \bullet 5^x = 200$

A) x = 20
B) x=3.21
C) x=1.15
D) x=2.86

12 Solve for x:

$4^{x+1} = 7$

(A) $\frac{\log 4}{\log 7} - 1$

(B) $\frac{\log 7}{\log 4} - 1$

(C) $\frac{\log 4 - 1}{\log 7}$

(D) $\frac{\log 7 - 1}{\log 4}$

13

The equation $A(t) = A_0\left(\frac{1}{2}\right)^{\frac{t}{3}}$ represents a radioactive sample after t years. How much time will it take for 15% of the sample to remain?

(A) 0.7 years
(B) 0.9 years
(C) 8.2 years
(D) 10.0 years

14 What is the domain of y = log x ?

A) $x \in R$
B) $x < 0$
C) $x > 0$
D) $x \geq 0$

Part II

1 Algebraically solve for x to two decimal places. 8 marks

$$2^{x-2} = 9^{x+4}$$

2A) Evaluate without technology and show all workings. 4 marks

$$\log_{\frac{1}{5}} 125$$

B) Using the property of logarithms, write as a single logarithm. 4 marks

$$\log_3 400 - 2\log_3 5 + \log_3 4$$

3 The pH of a solution, p(x) can be determined using the function p(x) = -log x where x represents the hydrogen ion concentration of the solution I mol/L.

A) Determine the pH of a solution that has a hydrogen ion concentration of 0.0015 mol/L.
2 marks

B) Determine the concentration of hydrogen ions in mol/l of grape fruit if it is known that grape fruit has a pH of 3. 2 marks

C) Black coffee generally has a pH of 5, and bleach has a ph of 13. In terms of their hydrogen ion concentrations, how many more times acidic is black coffee than bleach. Show workings algebraically.
4 marks

4 The equation $A = A_o(\frac{1}{2})^{\frac{t}{5}}$ represents the radioactive sample where the half-life of the sample is 5 years. If the initial mass of the sample is 80 grams, algebraically determine how long it would take for the sample to reach 10 g to two decimal places.

7 marks

5 A $1500 investment was made with 4% interest compounded **semi-annually**.

A) Write a model in the form $A = A_0(1+i)^t$ to describe its exponential growth. 2marks

B) Using your answer in A, algebraically determine how long it will take to grow to $4500 to the nearest year.

Workings must be shown algebraically. 6 marks
End