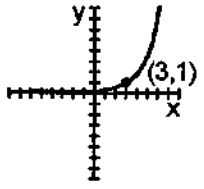
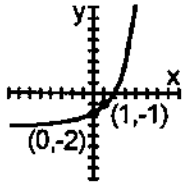
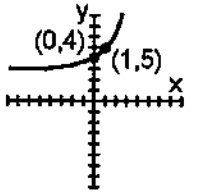
Math 433: Lesson #70

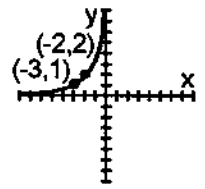
Name _____

1) Which of the following diagrams is a reasonable graph of $y = 2^x - 3$?

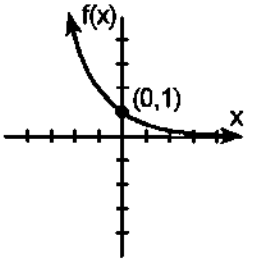
A) 

B) 

C) 

D) 

2) Which of the following equations could be represented by the graph below?



A) $y = \log_x 2$ B) $y = 2^x$ C) $y = \log_2 x$ D) $y = 2^{-x}$

3) Which equation is equivalent to $y = 10^x$?

A) $y = (\frac{1}{10})^x$ B) $y = 10^{-x}$ C) $y = (\frac{1}{10})^{-x}$ D) $y = -10^{-x}$

4) (a) Sketch and label the graph of the equation $y = 3^x$.

(b) On the same set of axes, sketch and label the reflection of the graph of $y = 3^x$ in the line $y = x$.

(c) Write the equation for the reflected graph sketched in part (b).

(d) Using the graph sketched in part (b), describe the behavior of the graph in Quadrant IV as x approaches 0.

5) Solve: $100^{x+2} = 1{,}000^{x-1}$

6) Solve: $2x^{-\frac{1}{2}} - 4 = 2$

7) Solve: $9^{2x} = \left(\frac{1}{3}\right)^{x+1}$

8) Which equation is equivalent to $y = 3^x$?

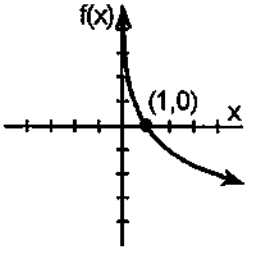
A) $\log_y x = 3$ B) $\log_3 y = x$ C) $\log_y 3 = x$ D) $\log_3 x = y$

9) What is $y = (\sqrt{5})^x$ written in logarithmic form?

A) $x = \log_y (\sqrt{5})$ B) $y = \log_x (\sqrt{5})$ C) $y = \log_{(\sqrt{5})} x$ D) $x = \log_{(\sqrt{5})} y$

10) Solve: $\log_x 27 = \frac{3}{4}$

11) Which of the following equations could be represented by the graph below?



A) $y = -\log_2 x$ B) $y = 2^{-x}$ C) $y = 2^x$ D) $y = \log_2 x$

12) If the graphs of the equations $y = \log_3 x$ and $y = 2$ are drawn on the same set of axes, they will intersect where x is equal to

A) 1 B) 2 C) 3 D) 9

13) Which of the following is the inverse relation of $y = \log 5x$?

A) $y = \log_{5x} 10$ B) $y = \dfrac{1}{\log 5x}$ C) $y = \dfrac{10^x}{5}$ D) $y = 5x$

14) Sketch the graph of $y = \log_3 x$ over the domain $\{\frac{1}{9} \le x \le 9\}$.

15) The expression $\log\left(\dfrac{x^n}{\sqrt{y}}\right)$ is equivalent to

A) $n \log x - \frac{1}{2}\log y$ C) $n \log x - 2 \log y$

B) $\log (nx) - \log (\frac{1}{2}y)$ D) $\log (nx) - \log (2y)$

16) If $\log 5 = a$, then $\log 0.0005$ is

A) $a - 3$ B) $a - 4$ C) $4 - a$ D) $3 - a$

17) If $\log M > 0$, then

A) $0 < \dfrac{1}{M} \le 1$ B) $M \le 1$ C) $0 < M \le 1$ D) $M > 1$

18) Which of the following statements below are true based on the definition of the logarithm $y = \log_b x$?

I. $x > 0$
II. $b > 0$
III. $b \neq 1$
IV. $y > 0$

A) II, III, and IV, only C) I, II, and III, only
B) I, only D) I and III, only

19) Which of the following statements are true?

I. $\log(3 \cdot 5) = 3 \log 5$

II. $\log(3 \cdot 5) = \log 3 + \log 5$

III. $\log(3 \cdot 5) = \log 3 \cdot \log 5$

IV. $\log(3 \cdot 5) = \log 15$

A) II, III, and IV, only
C) I, only
B) I, II, and III, only
D) II and IV, only

20) Which of the following statements are true?

I. $\log\left(\frac{28}{7}\right) = \frac{\log 28}{\log 7}$

II. $\log\left(\frac{28}{7}\right) = \log 28 - \log 7$

III. $\log\left(\frac{28}{7}\right) = \log 4$

IV. $\log\left(\frac{28}{7}\right) = \frac{1}{7} \log 28$

A) II and III, only
C) I, II, and III, only
B) I and II, only
D) II, only

21) Simplify: $\log_3(\log_4 64)$

A) 1
B) 2
C) 3
D) 4

22) If $\log_{10}(ab) = 10$ and $\log_{10} b = 5$, what is the value of a?

A) $\frac{1}{10}$
B) 10,0000
C) 50
D) 5

23) Solve for x: $\log_2(x - 3) + \log_2(x + 1) = 5$

A) $\{-7,5\}$
B) 5, only
C) 7, only
D) $\{-5,7\}$

24) Solve for x: $\log(x - 3) + \log(x + 4) - \log x = \log 5$

A) $\{-2,6\}$
B) 6, only
C) $\{-6,2\}$
D) $\{2,6\}$

25) Given that $\log_2 3 = 1.58$, and $\log_2 7 = 2.81$, evaluate $\log_2 147$ to the nearest hundredth.

A) 6.87 B) 10.01 C) 7.20 D) 21.25

26) Given that $\log_2 3 = x$, $\log_2 5 = y$, and $\log_2 7 = z$, express $\log_2 \frac{\sqrt[4]{35}}{\sqrt[4]{3}}$ in terms of x, y, and z.

A) $\frac{1}{4}(yz - x)$ B) $2^y \cdot 2^z \div 2^x$ C) $\frac{1}{4}(y + z - x)$ D) $4(y + z - x)$

27) Express $\log x$ in terms of $\log a$, $\log b$, and $\log c$: $x = a \cdot b$

28) Solve for x to the nearest tenth: $4^x = 28$

29) Given $\log_x A = 3$ and $\log_x B = 2$, evaluate:

(1) $\log_x \frac{A}{B^3}$

(2) $\log_x AB^2$

30) Given $\log_x A = 3$ and $\log_x B = 2$, evaluate:

(1) $\log_x \frac{A}{B^2}$

(2) $(\log_x AB)^2$

31) Solve for x to the nearest tenth: $4^{x+1} = 23$

32) Express in simplest radical form:

a) $\sqrt[4]{27} \cdot \sqrt[8]{9}$

b) $\dfrac{\sqrt[3]{4}}{\sqrt[6]{2}}$

c) $\sqrt[4]{x^3} \cdot \sqrt[6]{x} \div \sqrt{x^5}$

33) Simplify: $\sqrt[4]{\dfrac{9^{1-\pi}}{9^{1+\pi}}}$

34) If $\log 3 = .48$ and $\log 4 = .60$, find

a) $\log 4.5$

b) $\log \sqrt[3]{18}$

35) Using a calculator, evaluate or solve to 2 dec. places.

a) $\log_3\left(\frac{1}{5}\right)$

b) $.7^{x-3} = 14$