Ch. 21 – BOARD PROBLEMS

$f(x) = 3x - 5$ $g(x) = -2x^2$ $h(x) = \dfrac{1}{x-1}$

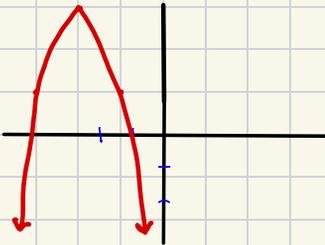1) $f(g(x)) =$

2) $g(f(x)) =$

3) $h(f(x)) =$

4) $g(h(x)) =$

5) $f(g(2)) =$

6) $g(f(-2)) =$

7) $g(h(3)) =$

8) $f(h(-3)) =$

DOMAIN: _____
RANGE : _____
FUNCTION: _____

9) write the equation for ① in VERTEX FORM

_____

10) WRITE ABOVE EQUATION IN STANDARD FORM.
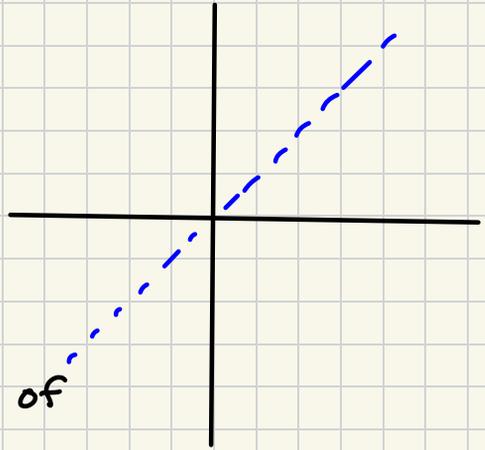
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Ch. 21 - LOGARITHMS

EXPONENT FORM

$y = a^x$

$y = 2^x$

LOGARITHM FORM

$\log_a y = x$

Logarithms are the opposite of
_____ .

PLOT EXPONENT

$y = 2^x$

x	y
-1	
0	
1	
2	

PLOT Logarithms

x	y

EXPONENT

$10^3 = 1000$

LOG

$\log$

Log FORM

EX. 1	$3^4 = 81$
EX. 2	$36^{\frac{1}{2}} = 6$

EXPONENT FORM

EX. 3	$\log_2 32 = 5$
EX. 4	$\log_8 16 = \frac{4}{3}$
EX. 5	$\log_2 (.125) = -3$

| EX. 6 | SOLVE FOR X. | CONVERT TO EXPONENT FORM. |

$$\log_5 125 = x$$

EX. 7

$$10^0 =$$
$$10^1 =$$
$$10^2 =$$
$$10^3 =$$

$$\log_{10}(1) =$$
$$\log_{10}(10) =$$
$$\log_{10}(100) =$$
$$\log_{10}(1000) =$$

$$\log_{10}(100 \cdot 10) = \log_{10}100 + \log_{10}10$$

EX. 8   USING A CALCULATOR

$$\log_{10} 5 = \qquad (Log)\ 5\ (ENTER)$$

$$\log_8 4 = \qquad (ALPHA)\ (WINDOW)\quad 5: logbase$$

EX. 9 $$\log_{10} 2 + \log_{10}(1000)$$

$$\underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$
mantissa   characteristic

EX. 10 $$\log x = 3.901 \qquad x = \underline{\hspace{2cm}}$$

THE OPPOSITE OF $\log_{10}$ IS 10^x

SO (2nd) (log) $3.901 = 10^{3.901} =$

$$\log(.0091) = \underline{\hspace{2cm}} \quad \underline{\hspace{2cm}}$$

Law of Logarithms

EXPONENT RULES

① $X^A \cdot X^B = X^{A+B}$

② $X^A \div X^B = X^{A-B}$

③ $\left(X^A\right)^B = X^{A \cdot B}$

LOGARITHM RULES

$\log_x (A \cdot B) = \log_x A + \log_x B$

$\log_x \left(\frac{A}{B}\right) = \log_x A - \log_x B$

$\log_x A^B = B \log_x A$

EX. 13

$45 \times 3,788 \times 88,919$

$\log(45) + \log(3788) + \log(88,919)$

$1.65 + 3.58 + 4.95 = \underline{\hspace{2cm}}$

Now do the Anti-log (2nd) (log) $\overset{10^x}{} = 10^{\underline{\hspace{1cm}}}$

Ex. 18

$\log_{10} x + \log_{10} 8 = 4$ Solve for x.

EX. 19

$\log_2 x + \log_2 (x+3) = 2$

Check your solutions!

NOTE: $\log_2 (\underline{\hspace{1cm}})$ cannot be ≤ 0

EX. 20

$\log x = 4.7782$

Rewrite the logarithms in exponential form.

1. $\log_5 25 = 2$

2. $\log_{\sqrt{3}} 3 = 2$

3. $\log_5 3 = x$

Rewrite the exponents as logarithms.

4. $2^x = 4$

5. $4^{2/3} = 2.52$

6. $5^x = y$

Solve for the variable.

7. $3^{x-1} = 27$

8. $\log_{1/5} x = 3$

9. $6^{3x+1} = 216$

Give the logarithm of each number using the characteristic and mantissa. (Use the log table in your instruction manual.)

10. $\log 300 =$

11. $\log 5,000 =$

12. $\log 8,000,000 =$

Given the characteristic and mantissa, find the number from the log table.

13. 1.3010

14. 8.9542

15. 6.7782

Employing what you have learned about the laws of logarithms, rewrite these expressions.

16. $\log_x \dfrac{4A}{B+2}$

17. $\log_x \dfrac{A^3}{B-1}$

18. $\log_x \dfrac{\sqrt{y-1}}{y}$

Solve for x using the laws of logarithms, and check your answer.

19. $\log_{10} x + \log_{10} 5 = 2$

20. $\log_6 x + \log_6 7 = 3$

21. $\log_4 (x + 6) + \log_4 x = 2$

Solve each problem using both logarithms and your calculator.

22. $(81.4)(1.37) =$

23. $\dfrac{31.2}{587} =$

24. $(4.27)^2 =$