



Name

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I. Change to logarithmic form (3 points)

1) $7^x = 100p$; $\log_7 100p = x$

2) $3^{-2x} = P/F$; $\log_3 P/F = -2x$

3) $(0.9)^t = \frac{1}{2}$; $\log_{0.9} \frac{1}{2} = t$

II. Change to exponential form (6 points)

1) $\log_3 81 = 4$; $3^4 = 81$

2) $\log_v w = q$; $v^q = w$

3) $\log_4 p = 5 - x$; $4^{5-x} = p$

4) $\log x = -8$; $10^{-8} = x$

5) $\ln x = \frac{1}{2}$; $e^{\frac{1}{2}} = x$

6) $\ln(t-5) = 1.2$; $e^{1.2} = (t-5)$

III. Solve the equation (4 points)

1) $\log_3 (x+4) = \log_3 (1-x)$

$x+4 = 1-x$

$2x = -3$

$x = -\frac{3}{2}$

2) $\ln x^2 = \ln (12-x)$

$x^2 = 12-x$

$0 = x^2 + x - 12$

$(x+4)(x-3)$

$x = -4$; $x = 3$

3) $\log_4 x = -\frac{3}{2}$

$x = 4^{-\frac{3}{2}}$

$x = \frac{1}{4}^{\frac{3}{2}}$

$x = \frac{1}{2}^3$

$x = \frac{1}{8}$

4) $e^{-\ln x} = 0.2$

$-\ln x = \ln 0.2$

$\ln x = -\ln 0.2$

$\ln x = \ln (0.2)^{-1}$

$\ln x = \ln 5$

$x = 5$

IV. Solve for t using logarithms with base a .

1) $3a^{4t} = 10$

$$a^{4t} = \frac{10}{3}$$

$$\log_a \frac{10}{3} = 4t$$

$$t = \frac{1}{4} \log_a \frac{10}{3}$$

2) $L = Ma^{t/N} - P$

$$L + P = Ma^{t/N}$$

$$\frac{L + P}{M} = a^{t/N}$$

$$\log_a \frac{L + P}{M} = \frac{t}{N}$$

$$N \log_a \frac{L + P}{M} = t$$

V. BONUS – Sketch the graph of f . (3 points)

1) $f(x) = \ln |x + 2|$

x	$f(x)$
-1	0
-0.5	0.41
0	0.69
0.5	0.92
1	1.09
1.5	1.25
2	1.38
2.5	1.5
3	1.61
3.5	1.70
4	1.79
4.5	1.87
5	1.94

x	$f(x)$
-1.8	-1.61
-1.6	-0.92
-1.4	-0.51
-1.2	-0.22

