

H. Math 3 Remediation Sheet for Unit 3

Name _____

<p>1) Write in exponential form $\ln x = p$</p> <p>$e^p = x$</p>	<p>2) Write in log form $m^c = p$</p> <p>$\log_m p = c$</p>
<p>3) Expand: $\log x^4 y^3$</p> <p>$4 \log x + 3 \log y$</p>	<p>4) Condense: $5 \log_2 x - 4 \log_2 m$</p> <p>$\log_2 \frac{x^5}{m^4}$</p>
<p>5) Simplify: $(5e^{-4x})^{-2}$</p> <p>$5^{-2} e^{8x}$</p> <p>$\frac{e^{8x}}{25}$</p>	<p>6) Solve: $e^{2x} - 5 = 19$</p> <p>$\ln e^{2x} = \ln 24$</p> <p>$2x \ln e = \ln 24$</p> <p>$x = 1.59$</p>
<p>7) Solve: $14 - \ln(x-3) = 8$</p> <p>$-\ln(x-3) = -6$</p> <p>$\ln(x-3) = 6$</p> <p>$e^6 = x-3$</p> <p>406.43</p>	<p>8) Solve: $25^{x+4} = 125^{3x-2}$</p> <p>$(5^2)^{x+4} = (5^3)^{3x-2}$</p> <p>$5^{2x+8} = 5^{9x-6}$</p> <p>$2x+8 = 9x-6$</p> <p>$14 = 7x$</p> <p>$2 = x$</p>
<p>9) Solve: $\log_5(x+3) + \log_5(x+2) = \log_5 6$</p> <p>$\log_5(x^2 + 5x + 6) = \log_5 6$</p> <p>$x^2 + 5x + 6 = 6$</p> <p>$x^2 + 5x = 0$</p> <p>$x(x+5) = 0$</p> <p>$x = 0$ $x = -5$</p>	<p>10) Suppose you deposit \$4500 in an account that pays 3.5% interest compounded quarterly. How long will it take to reach \$7000?</p> <p>$7000 = 4500 \left(1 + \frac{0.035}{4}\right)^{4(t)}$</p> <p>$\log 1.555556 = \log (1.00875)^{4t}$</p> <p>$15.126845$</p>

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11) Suppose you invest \$700 in the bank and it is compounded continuously. How long will it take to double?

$$A = Pe^{rt} \quad 4.25$$

$$1400 = 700e^{.0425t}$$

$$\ln 2 = \ln e^{.0425t}$$

$$\ln 2 = .0425t \ln e$$

16.31 yrs

12) A cup of coffee contains 140 mg of caffeine. If caffeine is eliminated from the body at a rate of 12% per hour, how long will it take for half of this caffeine to be eliminated?

$$y = 140(1 - .12)^x$$

$$70 = 140(1 - .12)^x$$

$$.5 = (.88)^x$$

5.42

13) Suppose you invest \$850 in a bank at 3.25% interest compounded monthly. How much money will you have in 8 years?

$$A = 850 \left(1 + \frac{.0325}{12}\right)^{12(8)}$$

\$ 1102.60

14) Evaluate: $\log_2 8 - \log_2 4$

$$\log_2 \frac{8}{4}$$

$$\log_2 2$$

1

15) Harry purchased a car for \$26,700. The value of the car decreases by 13% every year. What will be the value of the car in 10 years?

$$y = 26,700(1 - .13)^{10}$$

\$ 6632.91

16) Write a function that translates $y = 3^x$ five units to the left and 4 units up

$y = 3^{x+5} + 4$

17) Solve: $x^2 - 6x - 3 = 0$

$$x^2 - 6x + 9 = 3 + 9$$

$$(x - 3)^2 = 12$$

$$x - 3 = \pm 2\sqrt{3}$$

$3 \pm 2\sqrt{3}$

18) Solve: $2|x - 4| - 3 > 9$

$$|x - 4| > 6$$

$$x - 4 > 6 \quad \text{OR} \quad -x + 4 > 6$$

$$x > 10 \quad \text{OR} \quad -x > 2$$

$x < -2$

19) Find $f \circ g(x)$ if $f(x) = x^2 - 7$ & $g(x) = 3x - 2$

$$f(g(x))$$

$$f(3x - 2)$$

$$(3x - 2)^2 - 7$$

$$9x^2 - 12x + 4 - 7$$

$9x^2 - 12x - 3$

20) Find $f^{-1}(x)$ if $f(x) = 7x - 2$

$$y = 7x - 2$$

$$x = \frac{y + 2}{7}$$

$$\frac{x + 2}{7} = y$$

$f^{-1}(x) = \frac{x + 2}{7}$