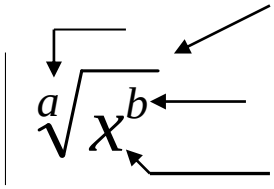
Reflective Portfolio
Unit #3: Exponential and Logarithmic Functions

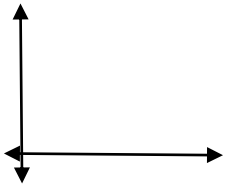
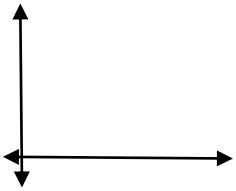
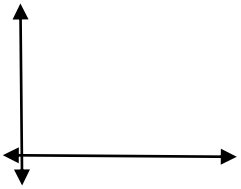
DIRECTIONS: Print and complete! Hand it in inside your 2 pocket folder along with Units #1 & #2!!

Section #1: Vocabulary (words and/or diagrams)
Define each:

- **Logarithm - _____**
- **Common Logarithm - _____**
- **Natural Logarithm - _____**
- **Label with the correct word (index(root), radicand, exponent, radical)**



Sketch the graph of each:

Exponential Growth	**Exponential Decay**	**Logarithmic**
		

Section #2: Formulas/Equations/Rules

- **Exponent Rules**

$x^0 =$ _____ $x^1 =$ _____ $x^a \bullet x^b =$ _____ $\frac{x^a}{x^b} =$ _____

$(x^a)^b =$ _____ $(xy)^a =$ _____ $(x^{-a}) =$ _____

- **Exponential Growth/Decay Standard Equation**

$y = ab^x$ **where y = _____ a = _____ x = _____**

b = _____ (1 + r) growth; (1 – r) decay; r = _____

- **<u>Compound</u> Interest Formula**

$A = P\left(1+\frac{r}{n}\right)^{nt}$ **where A = _____ P = _____ r = _____**

t = _____ n = _____ compounded annually n = 1

compounded quarterly n = _____ compounded monthly n = _____

compounded weekly n = _____ compounded daily n = _____

•**<u>Continuous</u> Growth/Decay Formula**

$A = Pe^{rt}$ **where A = _____ P = _____ t = _____**

r = _____ growth: r is positive decay: r is negative

•**Log Properties**

$\log_b 1 =$	$\log_b b =$	$\log_b(m^n) =$
$\log_b(mn) =$		$\log_b\left(\frac{m}{n}\right) =$
Change of base formula: $\log_b m =$		

Section #3: Key methods and concepts (<u>write out the process while solving the example</u>)

$\frac{power}{root}$

•**How to convert a radical to a fractional exponent**

#1) $5\sqrt[3]{x^2y}$

•**How to convert a fractional exponent to a radical**

#2) $8x^{\frac{2}{3}}$

•**How to convert negative exponents to positive exponents**

#3) $\frac{2x^4y^{-4}z^{-3}}{6x^2y^{-3}z^4}$

•**How to solve an equation with a fractional exponent**

#4) $2m^{\frac{3}{4}} = 54$

•**How to solve exponential equations algebraically using common bases**

#5) : Solve $25^{2x-1} = 125^{3x+4}$

• **Rewrite log equation as exponential equation**

$\log_b m = x$

• **Rewrite exponential equation as log equation**

$x^a = p$

- **How to solve logarithmic equations algebraically**

#6) $3\log_8(x+6)+5=6$ #7) $\log_3(5x+20)-\log_3 x=2$

- **How to solve exponential equations algebraically** ***(round to the nearest hundredth)***

#8) $30=3e^{5x}+9$ #9) $50(2)^x=1000$

- **How to find the inverse of a logarithmic equation <u>algebraically</u>**

#10) $f(x)=\log_5(x-2)+7$

- **How to find the inverse of an exponential equation <u>algebraically</u>**

#11) $f(x)=10^x-4$

Answers: #1) $5x^{\frac{2}{3}}y^{\frac{1}{3}}$ **#2)** $8\sqrt[3]{x^2}$ **#3)** $\frac{x^2}{3yz^7}$ **#4) 81 #5) -14/5 #6) – 4 #7) 5 #8) .39 #9) 4.32**

#10) $f^{-1}(x)=5^{x-7}+2$ **#11)** $f^{-1}(x)=\log(x+4)$