Pre-Calculus 30 **Chapter 8 Review**

The inverse of $y = c^x$ is: a) $y = \log_c x$ in logarithmic form (where *x*, *c* > *0* and *c* ≠ *1*)

b) $x = c^y$ in exponential form (where *x*, *c* > *0* and *c* ≠ *1*)

The graphs of an exponential function and its inverse logarithmic function are reflections of each other about the line $y = x$

Exponential form to Logarithmic form: $\boxed{y = c^x \longleftrightarrow \log_c y = x}$

For the logarithmic function $y = \log_c x$

- the domain if {x : x > 0, x Є R}
- the range is {y : y Є R}
- the x-intercept is 1
- the vertical asymptote is x = 0

For the logarithmic function $y = a\log_c(b(x-h)) + k$

- the domain if {x : x > h, x Є R}
- the range is {y : y Є R}
- the x-intercept is dependent on the shift (vertical or horizontal) and/or the horizontal stretch
- the vertical asymptote is x = h

(Note: ***a*** is vertical stretch, ***b*** is horizontal stretch, ***h*** is horizontal translation/shift, ***k*** is vertical translation/shift)

Laws of Logarithms

$$\log_c MN = \log M + \log N$$

$$\log_c \frac{M}{N} = \log_c M - \log_c N$$

$$\log_c M^P = P\log_c M$$

Solving Logarithmic Equations:

Logs on both sides: If $\log_c L = \log_c R$, then $L = R$

Log on one side: If $\log_c x = y$, then $c^y = x$

Solving Exponential Equations

If possible, write both sides with a common base

Take the log of both sides

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