

PROPERTIES OF EXPONENTIAL FCTS

(59a)

$$f(x) = a^x$$

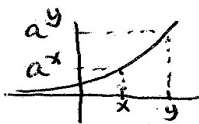
ALLOWABLE BASES: $a > 0, a \neq 1$

RANGE: $(0, \infty)$; $a^x > 0$ STRICT! FOR ALL x

DOMAIN: $(-\infty, \infty)$; EXPONENTIAL FCTS ARE DEFINED EVERYWHERE

ONE-TO-ONE FCTS

FOR $a > 1$:



INCREASING
 $x < y$
 IS EQUIVALENT TO
 $a^x < a^y$

FOR $0 < a < 1$:



DECREASING
 $x < y$
 IS EQUIVALENT TO
 $a^x > a^y$

KEY PROPERTY OF EXPONENTIAL FCTS

(59b)

$$f(x) = 2^x$$

x	2^x
-2	$\frac{1}{4}$
-1	$\frac{1}{2}$
0	1
1	2
2	4
3	8

$\Delta x = 1$ is indicated by arrows between rows, and $\cdot 2$ indicates the scaling factor between consecutive y-values.

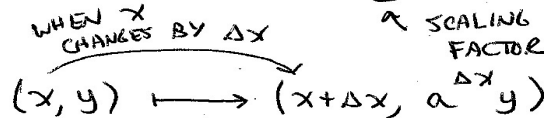
$$a = 2$$

$$\Delta x = 1$$

$$a^{\Delta x} = 2^1 = 2$$

LET $f(x) = a^x$

THEN $f(x + \Delta x) = a^{x + \Delta x}$
 $= a^x a^{\Delta x}$
 $= a^{\Delta x} \cdot f(x)$



y GETS MULTIPLIED BY A SCALING FACTOR