

## End Behavior on Exponential

4/20/200

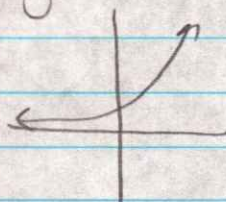
As  $x \rightarrow \infty$ ,  $f(x) \rightarrow \boxed{\quad}$   
 As  $x \rightarrow -\infty$ ,  $f(x) \rightarrow \boxed{\quad}$

right left

\*  $f(x) = y \rightarrow$  means up or down, or asymptote

Ex1:

$$y = 3^x$$

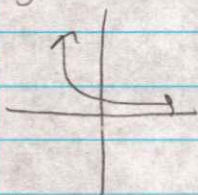
Growth  $b > 1$ 

$$\text{As } x \rightarrow \infty, f(x) \rightarrow \boxed{\infty}$$

(pointing up)

$$\text{As } x \rightarrow -\infty, f(x) \rightarrow \boxed{0}$$

(approaches asymptote &amp; Asymptote = 0)

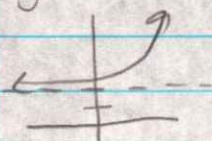
Ex2:  $y = \left(\frac{1}{3}\right)^x$  decay  $b < 1$ 

$$\text{As } x \rightarrow \infty, f(x) \rightarrow \boxed{0}$$

Asymptote  
- Right side points to

$$\text{As } x \rightarrow -\infty, f(x) \rightarrow \boxed{\infty}$$

left pts up

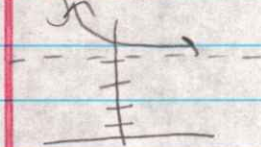
Ex3:  $y = 3^x + 2$  (up 2)

$$\text{As } x \rightarrow \infty, f(x) \rightarrow \boxed{\infty}$$

right pts up

$$\text{As } x \rightarrow -\infty, f(x) \rightarrow \boxed{2}$$

left pts to asymptote

Ex4  $y = \left(\frac{1}{3}\right)^x + 4$  decay up 4

$$\text{As } x \rightarrow \infty, f(x) \rightarrow \boxed{4}$$

right pts to Asymptote

$$\text{As } x \rightarrow -\infty, f(x) \rightarrow \boxed{\infty}$$

left pts up