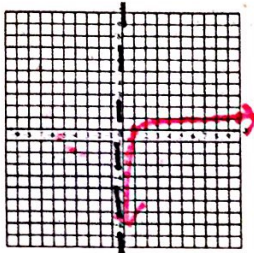


**\* Asymptote is opposite inside \***

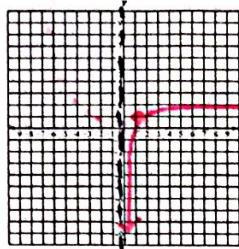
**Graphing Logarithmic Functions**

1. Sketch:  $y = \log(x)$   $b=10$



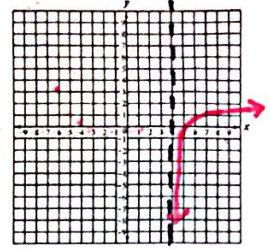
- a. Domain:  $(0, \infty)$
- b. Range:  $(-\infty, \infty)$
- c. Asymptotes:  $x=0$
- d. End Behavior:  
 $x \rightarrow \infty, y \rightarrow \infty$   
 $x \rightarrow 0, y \rightarrow -\infty$
- e. Y-intercept: none
- f. X-intercept:  $(1, 0)$

2. Sketch:  $y = \log(x) + 1$   $b=10$   
 ↳ shift up 1 unit



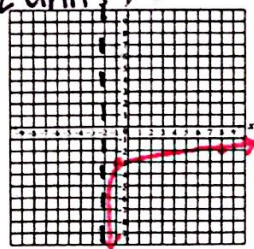
- a. Domain:  $(0, \infty)$
- b. Range:  $(-\infty, \infty)$
- c. Asymptotes:  $x=0$
- d. End Behavior:  
 $x \rightarrow \infty, y \rightarrow \infty$   
 $x \rightarrow 0, y \rightarrow -\infty$
- e. Y-intercept: none
- f. X-intercept:  $(.1, 0)$

3. Sketch:  $y = \log(x-4)$   $b=10$   
 ↳ shift right 4 units



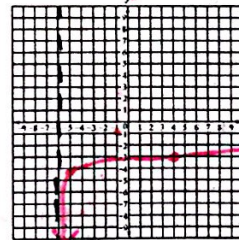
- a. Domain:  $(4, \infty)$
- b. Range:  $(-\infty, \infty)$
- c. Asymptotes:  $x=4$
- d. End Behavior:  
 $x \rightarrow \infty, y \rightarrow \infty$   
 $x \rightarrow 4, y \rightarrow -\infty$
- e. Y-intercept: none
- f. X-intercept:  $(5, 0)$

4. Sketch:  $y = \log(x+2) - 3$   
 ↳ shift left 2 units  
 ↳ shift down 3 units



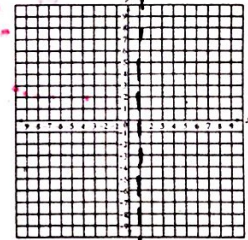
- g. Domain:  $(-2, \infty)$
- h. Range:  $(-\infty, \infty)$
- i. Asymptotes:  $x=-2$
- j. End Behavior:  
 $x \rightarrow \infty, y \rightarrow \infty$   
 $x \rightarrow -2, y \rightarrow -\infty$
- k. Y-intercept:  $(0, -2.699)$
- l. X-intercept:  $(998, 0)$

5. Sketch:  $y = \log(x+6) - 4$



- m. Domain:  $(-6, \infty)$
- n. Range:  $(-\infty, \infty)$
- o. Asymptotes:  $x=-6$
- p. End Behavior:  
 $x \rightarrow \infty, y \rightarrow \infty$   
 $x \rightarrow -6, y \rightarrow -\infty$
- q. Y-intercept:  $(0, -3.222)$
- r. X-intercept:  $(9994, 0)$

6. Sketch:  $y = \log(x-1) + 2$



- s. Domain: \_\_\_\_\_
- t. Range: \_\_\_\_\_
- u. Asymptotes:  $x=1$
- v. End Behavior:  
 $x \rightarrow \text{_____}, y \rightarrow \text{_____}$   
 $x \rightarrow \text{_____}, y \rightarrow \text{_____}$
- w. Y-intercept: \_\_\_\_\_
- x. X-intercept: \_\_\_\_\_

↳ change window to see this