

Good afternoon

Plan for calculus DS:

Wednesday: Mini lesson

Thursday: hw/reassessment/extra help

Today we will finish our discussion on absolute value, asymptotes, etc.  
and then you'll have time to work on the hw handout or old hw needed  
for retakes

Show that  $\lim_{x \rightarrow 1} \frac{-5x + 5}{|-x + 1|}$  DNE

$$-x + 1 \geq 0$$

$$\Rightarrow x \geq -1$$

$$\left\{ \begin{array}{l} \frac{-5x + 5}{(-x + 1)}, \quad x \leq 1 \\ \frac{-5x + 5}{-(-x + 1)}, \quad x > 1 \end{array} \right.$$

$$\left\{ \begin{array}{l} \frac{5(-x+1)}{(-x+1)} \\ \frac{5(-x+1)}{-(-x+1)} \end{array} \right.$$

$$\left\{ \begin{array}{l} 5, \quad x \leq 1 \\ -5, \quad x > 1 \end{array} \right.$$

$$\lim_{x \rightarrow 1^-} f(x) = 5$$

$$\lim_{x \rightarrow 1^+} f(x) = -5$$

$\neq$   $\rightarrow$  dne 😊

Test Prep: No Calculator

Find and classify all asymptotes of the function. Justify your classifications using limits.

$$f(x) = \frac{x+7}{x^2+5x-14}$$

H.A.  $\lim_{x \rightarrow \infty} f(x) = 0$

$y=0$   
h.a.

V.a. ① find candidates  
 $x^2+5x-14=0$  (den. = 0)  
 $(x+7)(x-2)=0$

② take  $x=-7, x=2$   
limits @ cand.

$$\lim_{x \rightarrow -7} \frac{x+7}{(x+7)(x-2)} \rightarrow \lim_{x \rightarrow -7} \frac{1}{x-2} = \frac{1}{-7-2} = -\frac{1}{9} \text{ not a v.a.}$$

$$\lim_{x \rightarrow 2} \frac{x+7}{(x+7)(x-2)} \rightarrow \lim_{x \rightarrow 2^+} \frac{1}{x-2} = \frac{1}{2^+-2} = \frac{1}{0^+} = \infty$$

$x=2$  v.a.

