Poll Q- Use the second - derivative test to  
classify each critical number as a local (relative)  
min, local max, or neither.  
$$f(x) = \frac{x^2 - x + 5}{x + 4}$$

Solution:  $f(x) = \frac{x^2 - x + 5}{x + 4}$ 

$$f'(x) = (2x-1)(x+4) - (x^{2}-x+5)(1) - (x^{2}-x+5)(1) - (x+4)^{2} - (x+4)^{2$$

Supplementary Problems Page 1

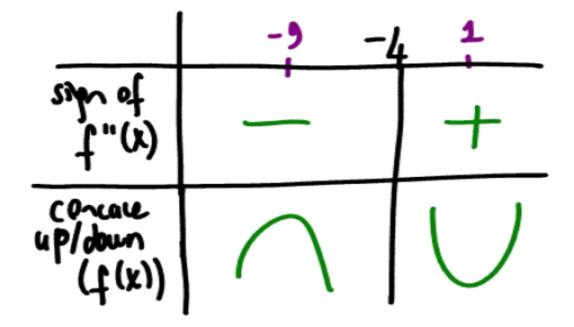
$$= \frac{(x+9)(x-1)}{(x+4)^{\nu}}$$
First-order critical numbers:  $f'(x)=0$  or DNE  

$$f'(x)=\frac{(x+9)(x-1)}{(x+4)^{\nu}}=0 \text{ or DNE} \xrightarrow{x=-9, 1}_{x=-9, 1}$$
f is undef at  $x=-4$  is x-coord.  
af v.A.

Second-order critical numbers: 
$$f''(x)=0$$
 or DWE  
 $f''(x)=\left(\frac{x^{2}+8x-9}{(x+4y)^{2}}\right)''$  Use quotient rile again  
 $f''(x)=\frac{(2x+18)(x+4y)^{2}-(x^{2}+8x-9)\cdot 2(x+4y)\cdot 1}{(x+4y)^{4}}$   
 $=\frac{2(x+4x)\left[(x+4y)^{2}-(x^{2}+8x-9)\right]}{(x+4y)^{4}}$ 

(x+4)<sup>4</sup>  $= \frac{2(x+4)\cdot 25}{(x+4)^4} = \frac{50}{(x+4)^3}$ + x=-4 m sign chart

Sign chart for 
$$f''(x) = \frac{50}{(x+y)^3}$$



since  $f''(-9) \angle 0$  local max at x=-9 $f''(1) \ge 0$  local min at x=1

x=4 is the x-coordinate of V.A. x=-4 is undefined, therefore, there's . NO PoI at x=-4



Supplementary Problems Page 3