Math 19: Quiz 3 Solutions Name:

For full credit you must (NEATLY) show your work. Partial credit may be given for incorrect solutions if sufficient work is shown.

For the function

$$f(x) = \frac{x-1}{x+2}$$

1. (2 pts) Find the partition numbers of f.

(1) $f(x) = 0$
$\Rightarrow x - 1 = 0$
$\Rightarrow \boxed{x = 1}$

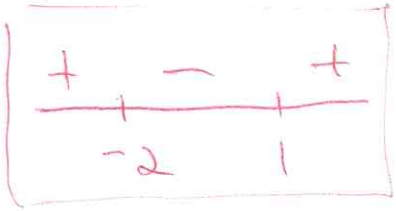
(2) f is discontinuous at x
$\Rightarrow x + 2 = 0$
$\Rightarrow \boxed{x = -2}$

2. (5 pts) Make a sign chart for f.

$(-\infty, -2)$: Test $x = -3$; $f(-3) = \frac{-3-1}{-3+2} = \frac{-4}{-1} = 4 > 0$

$(-2, 1)$: Test $x = 0$; $f(0) = \frac{0-1}{0+2} = \frac{-1}{2} < 0$

$(1, \infty)$: Test $x = 2$; $f(2) = \frac{2-1}{2+2} = \frac{1}{4} > 0$



3. (1 pt) Solve the inequality

$$\frac{x-1}{x+2} < 0.$$

$(-2, 1)$

4. (2 pts) Find the average rate of change of f from $x = 2$ to $x = 4$.

$$AROC = \frac{f(4) - f(2)}{4-2} = \frac{\frac{4-1}{4+2} - \frac{2-1}{2+2}}{2}$$

$$= \frac{\frac{3}{6} - \frac{1}{4}}{2}$$

$$= \frac{\frac{1}{4}}{2}$$

$$= \boxed{\frac{1}{8}}$$