MAC1140 SEC29 Quiz 09-17-2007 3.8

Mr. Fei Hua (fhua@math.fsu.edu)

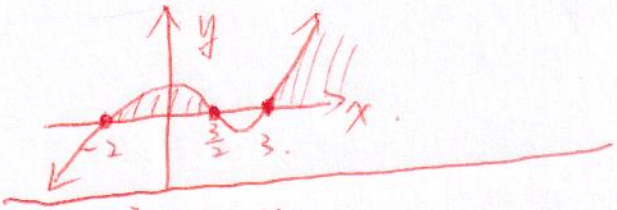
Full Name: Fei Hua Sec#: Date:

1.

[3.8.1aPT]Solve $(2x-3)(x+2)(x-3) \geq 0$

- $(-\infty, -2] \cup [\frac{3}{2}, 3]$
- $(-\infty, \frac{3}{2}] \cup [3, \infty)$
- none of these
- $[\frac{3}{2}, \infty)$
- $[-2, \frac{3}{2}] \cup [3, \infty)$

Zero: $\frac{3}{2}$, -2, 3.
multiplicity: 1, 1, 1.
local behavior: C. C. C.
ends: $(2x-3)(x+2)(x-3) \sim 2x^3$.



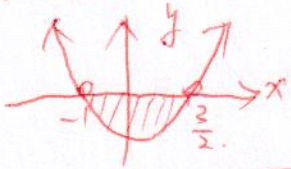
2.

[3.8.1BPT]Solve $3x^2 + x < 2$

- None of these
- $(-1, \frac{2}{3})$
- $(-\infty, -\frac{2}{3}) \cup (1, \infty)$
- $(-\infty, -1) \cup (\frac{2}{3}, \infty)$
- $(-\frac{2}{3}, 1)$

$3x^2 + x - 2 < 0$.
$(3x-2)(x+1) < 0$.
Zero: $\frac{2}{3}$, -1.
multi: 1, 1.
local: C. C.
ends: $(3x-2)(x+1) \sim 3x^2$

Of course, because the original is a quadratic function.

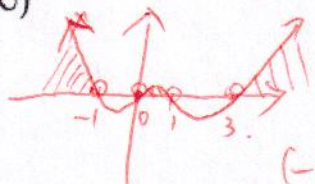


3.

[3.8.2aPT]Solve $\frac{x(x^2+4)(x-3)}{(x-1)(x+1)} > 0$

- $(-\infty, 0) \cup (3, \infty)$
- $(-\infty, -1) \cup (0, 1) \cup (3, \infty)$
- $(-\infty, -2) \cup (0, 2) \cup (3, \infty)$
- $(-\infty, -2) \cup (-1, 0) \cup (1, 2) \cup (3, \infty)$
- $(-1, 0) \cup (1, 3)$

1. $x(x^2+4)(x-3)(x-1)(x+1) > 0$.
Zero: 0, ~~0~~, 3, 1, -1.
multi: 1 1 1 1
local: C C C C
ends: $\sim x^6$.



$(-\infty, -1) \cup [0, 1) \cup (3, +\infty)$

2. Exclude the points where the R.F. is undefined. (i.e. 1, -1)
But in our case no change is needed.

SEE NEXT PAGE.

Careful!

Solve $\frac{(x+5)^2}{(2-x)(2+x)} \leq 0$.

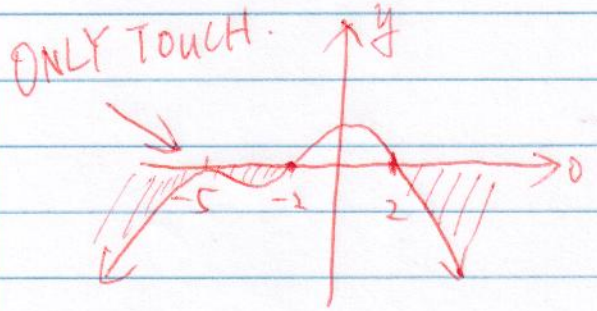
1. $(x+5)^2(2-x)(2+x) \leq 0$.

Zeros: -5, 2, -2.

Multi: 2, 1, 1.

Local: T, C, C

Ends: $-x^4$ (If you multiply out the leading term should have a negative sign).



So $(-\infty, -2] \cup [2, +\infty)$

2. Exclude the points where the original rational function is undefined. (i.e. $2, -2$).

So the answer for the rational inequality is.

$(-\infty, 2) \cup (2, +\infty)$