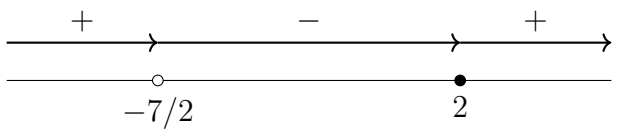
MAC 2311 Quiz 1: Lectures 1&2

1. Solve the inequality
$$\frac{3x+5}{x-2} \leq 1$$
and write the answer in interval notation.

Xingjian Solution: Move right hand side to left hand side, you will get:
$$\frac{3x+5}{x-2} - 1 \leq 0.$$
Simplify it, then you will get:
$$\frac{3x+5-x+2}{x-2} = \frac{2x+7}{x-2} \leq 0.$$
Then we need to find the critical point: one is $x = -\frac{7}{2}$(from $2x+7=0$) The other one is $x = 2$(from $x-2=0$ but we can not take this value[it shows up in denominator!])
Then our next step is we can draw the number line:

	$x=-4$	$x=0$	$x=3$
$x-2$	-6 $(-)$	-2 $(-)$	1 $(+)$
$2x+7$	-1 $(-)$	7 $(+)$	13 $(+)$



Then choose for "-" sign for inequality less and equal to 0, we will get $(-\frac{7}{2}, 2]$.
the answer $(-\frac{7}{2}, 2]$.

2. Find the domain of the function and write your answer in interval notation.
$$f(x) = \frac{\sqrt{2x-2}}{x-1}$$

First $x-1 \neq 0$ in denominator, that implies $x \neq 1$.
Second, $2x-2 \geq 0$, that implies $x \geq 1$.
By intersection, $x \in (1, \infty)$.

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