

Quiz 3 MTH 140 Fall 2025

Thursday, September 4, 2025

11:08 AM

Note: this problem is too complicated to put on an exam!



$$\frac{2}{x-1} + \frac{5}{x+1} > 0$$

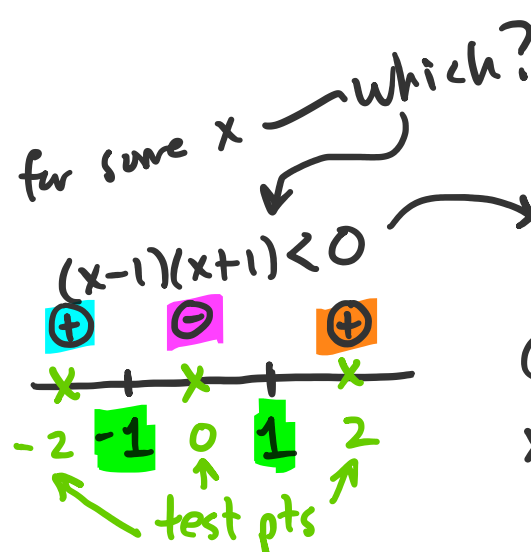
$x=1, -1$ are forbidden!

WANT TO

BUT

this quantity can be negative for some x

Mult by $(x-1)(x+1)$



Solve equality

$$(x-1)(x+1) = 0$$

$$x = 1, -1$$

test pt	$(x-1)(x+1)$
-2	+
0	-
2	+

Case 1: So if x is in $(-\infty, -1) \cup (1, \infty)$, then $(x-1)(x+1) > 0$

Case 2: if x is in $(-1, 1)$, then $(x-1)(x+1) < 0$.

Case 1

multiply by $(x-1)(x+1) > 0$ to get

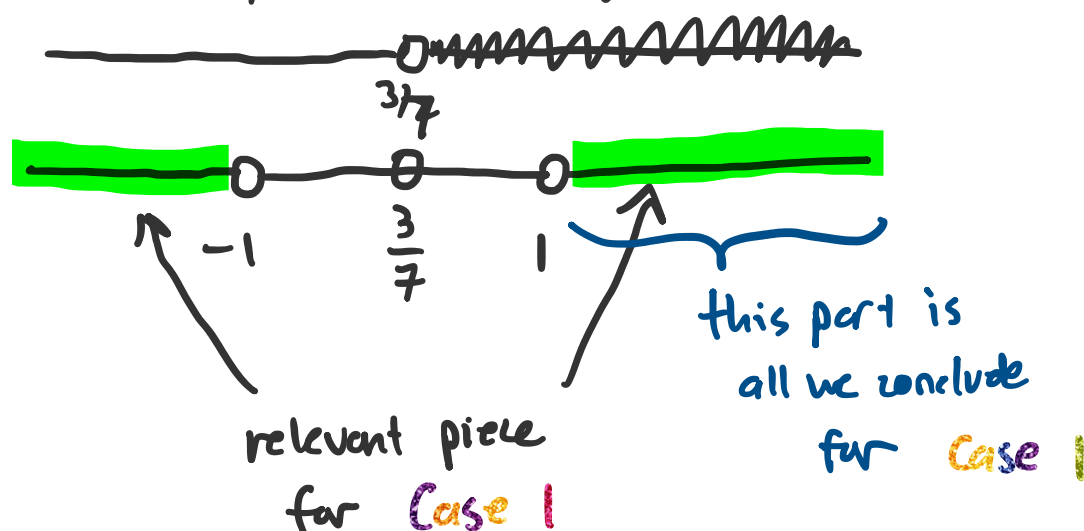
$$2(x+1) + 5(x-1) > 0$$

$$2x+2+5x-5 > 0$$

$$7x-3 > 0$$

$$x > \frac{3}{7}$$

$x > \frac{3}{7}$, in general



So Case 1 gives us $x > 1$.

Case 2

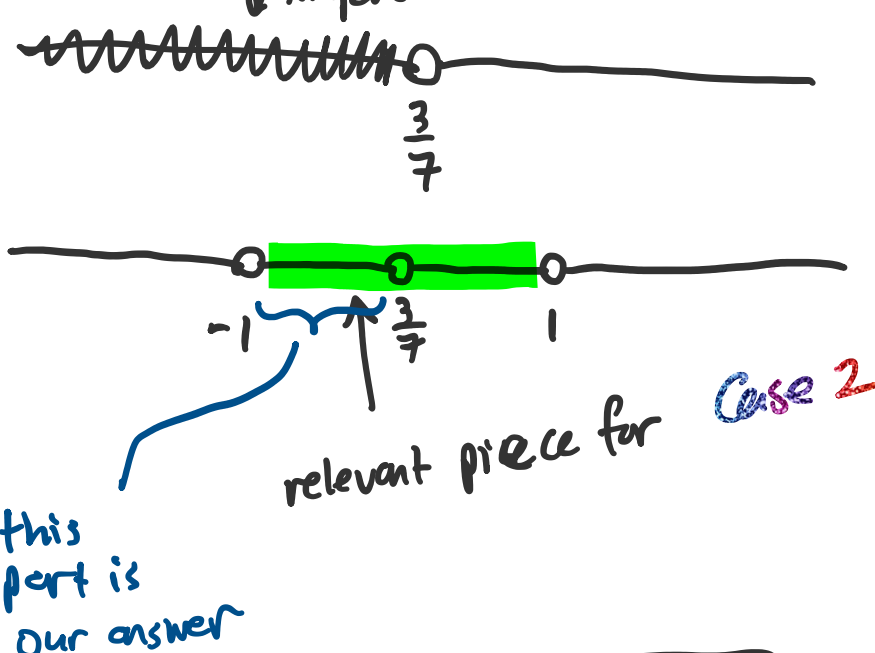
Multiply by $(x-1)(x+1) < 0$ to get

$$2(x+1) + 5(x-1) < 0$$

$$7x-3 < 0$$

$$x < \frac{3}{7}$$

in general



So Case 2 gives us $-1 < x < \frac{3}{7}$

Combining Case 1 + Case 2 gives solution

$$(1, \infty) \cup (-1, \frac{3}{7})$$