

Quiz 3 MTH140 Fall 2026

Sunday, September 13, 2026

8:46 AM

$$\frac{5}{w-3} + \frac{1}{w+3} \leq 0$$

Forbidden for $w-3=0$ or $w+3=0$
 $\downarrow$ $\downarrow$
 $w=3$ $w=-3$

Now solve the equality

$$\frac{5}{w-3} + \frac{1}{w+3} = 0$$

Mult by common denominator $(w-3)(w+3)$ to get

$$5(w+3) + 1(w-3) = 0$$

$\downarrow$ distribute

$$5w + 15 + w - 3 = 0$$

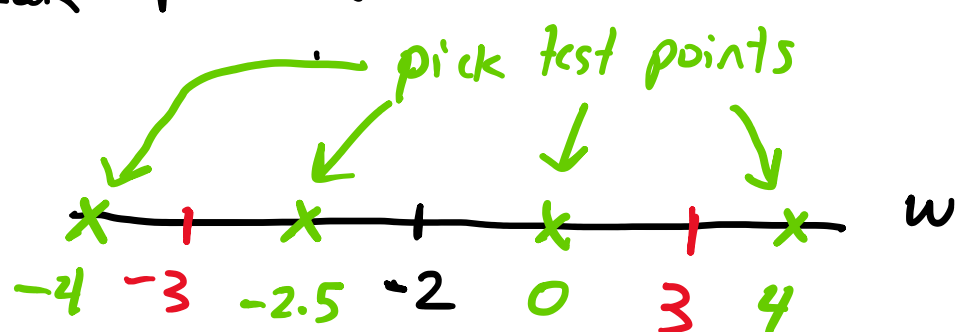
$\downarrow$ collect like terms

$$6w + 12 = 0$$

$\downarrow$

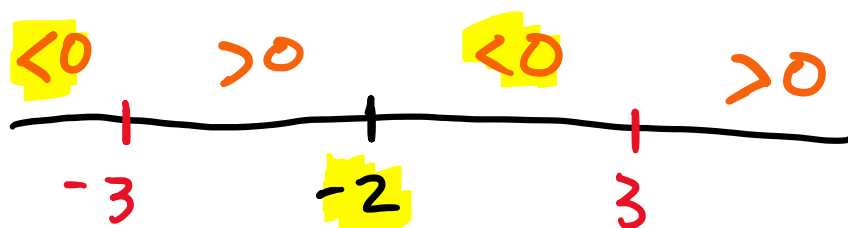
$$w = -\frac{12}{6} = -2$$

Now break up number line at $w=-2$ and the forbidden points:



test point $w =$	$\frac{5}{w-3} + \frac{1}{w+3} =$
-4	$\frac{1}{-4-3} + \frac{1}{-4+3} = -\frac{1}{7} - 1 < 0$
-2.5	$\frac{5}{-5.5} + \frac{1}{0.5} \approx 1.09 > 0$
0	$\frac{5}{-3} + \frac{1}{3} < 0$
4	$\frac{5}{1} + \frac{1}{7} > 0$

So we see



We have < 0 whenever $-\infty < w < -3$ and $-2 < w < 3$

So we have ≤ 0 on

$-\infty < w < \boxed{3}$ or $-2 \leq w < \boxed{3}$ (as inequalities)
 $\uparrow$
 forbidden, so can't include

OR

$(-\infty, -3) \cup [-2, 3)$ (as intervals)

OR

