Precalculus
Quadratic inequality part 1

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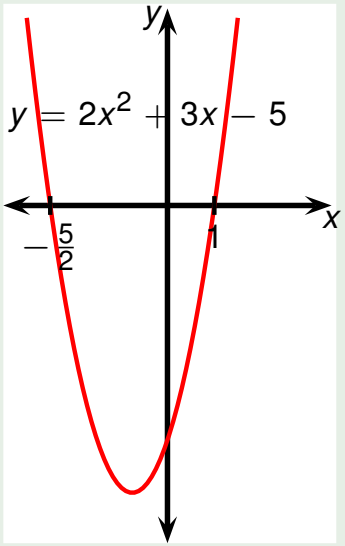
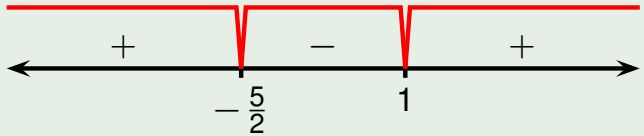
Example



Solve the inequality.

$$\begin{aligned} 2x^2 + 3x - 5 &\geq 0 \\ (2x+5)(x-1) &\geq 0 \\ x \in \left(-\infty, -\tfrac{5}{2}\right] \cup [1, \infty) & \end{aligned}$$

Left hand side vanishes when $x = -\frac{5}{2}$ and when $x = 1$. The two roots split the real line into three intervals: $\left(-\infty, -\frac{5}{2}\right), \left(-\frac{5}{2}, 1\right), (1, \infty)$.



Interval	Factor signs	Final sign	Sample pt	Value at sample pt
$\left(-\infty, -\frac{5}{2}\right)$	$(-)(-)$	$+$	-100	$f(-100) > 0$
$\left(-\frac{5}{2}, 1\right)$	$(+)(-)$	$-$	0	$f(0) = -5 < 0$
$(1, \infty)$	$(+)(+)$	$+$	100	$f(100) > 0$