Sign of a Quadratic Function

Given: $f(x)= x^2 + x - 6$, determine where the function is positive and negative.

Method:
1. Find the zeros
2. Sketch a portion of the parabola on a number line
3. Determine the sign

Solution: $f(x) = x^2 + x - 6$

Find zeros:

$x^2 + x - 6 = 0$ Factor

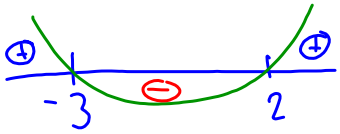
$(x+3)(x-2) = 0$

$x+3=0 \quad x-2=0$

$x = -3 \quad x = 2$

(2) Put solution on a number line

a (+)



(3) Answer:

$f(x) \geq 0$ over $]-\infty,-3] \cup [2,\infty[$

$f(x) \leq 0$ over $[-3,2]$

- $f(x) > 0$ ← strictly positive doesn't touch x-axis.

$\rightarrow f(x) > 0$ over $]-\infty,-3[\cup]2,+\infty[$

- $f(x) < 0$ ← strictly negative

$f(x) < 0$ over $]-3,2[$