$f(x) = ax + b$

The root is $x = -\frac{b}{a}$.

Case a: If $a>0$ then when $x<-\frac{b}{a}$, $f(x)<0$ and when $x>-\frac{b}{a}$, $f(x)>0$.

x	$-\infty$		$-\frac{b}{a}$		$+\infty$
$f(x)$		$-$	0	$+$	

Case b: If $a<0$ then when $x<-\frac{b}{a}$, $f(x)>0$ and when $x>-\frac{b}{a}$, $f(x)<0$.

x	$-\infty$		$-\frac{b}{a}$		$+\infty$
$f(x)$		$+$	0	$-$	

$f(x) = ax^2 + bx + c$

Case a: $\Delta = b^2 - 4ac > 0$: two distinct roots exist $(x_1 \& x_2)$:

x	$-\infty$		x_1		x_2		$+\infty$
$f(x)$		Same as a	0	Opposite of a	0	Same as a	

Between the roots $f(x)$ has the opposite sign of a (the leading coefficient)
and outside the roots $f(x)$ has the same sign as a.

Case b: $\Delta = 0$: a repeated root (x_1)

x	$-\infty$		x_1		$+\infty$
		Same as a	0	Same as a	

$f(x)$ has the same sign as a.

Case C: $\Delta < 0$: no roots

x	$-\infty$		$+\infty$
		Same as a	

$f(x)$ has the same sign as a.

Every polynomial of higher degree can be factorized and written as a multiplication of first and second degree polynomials.