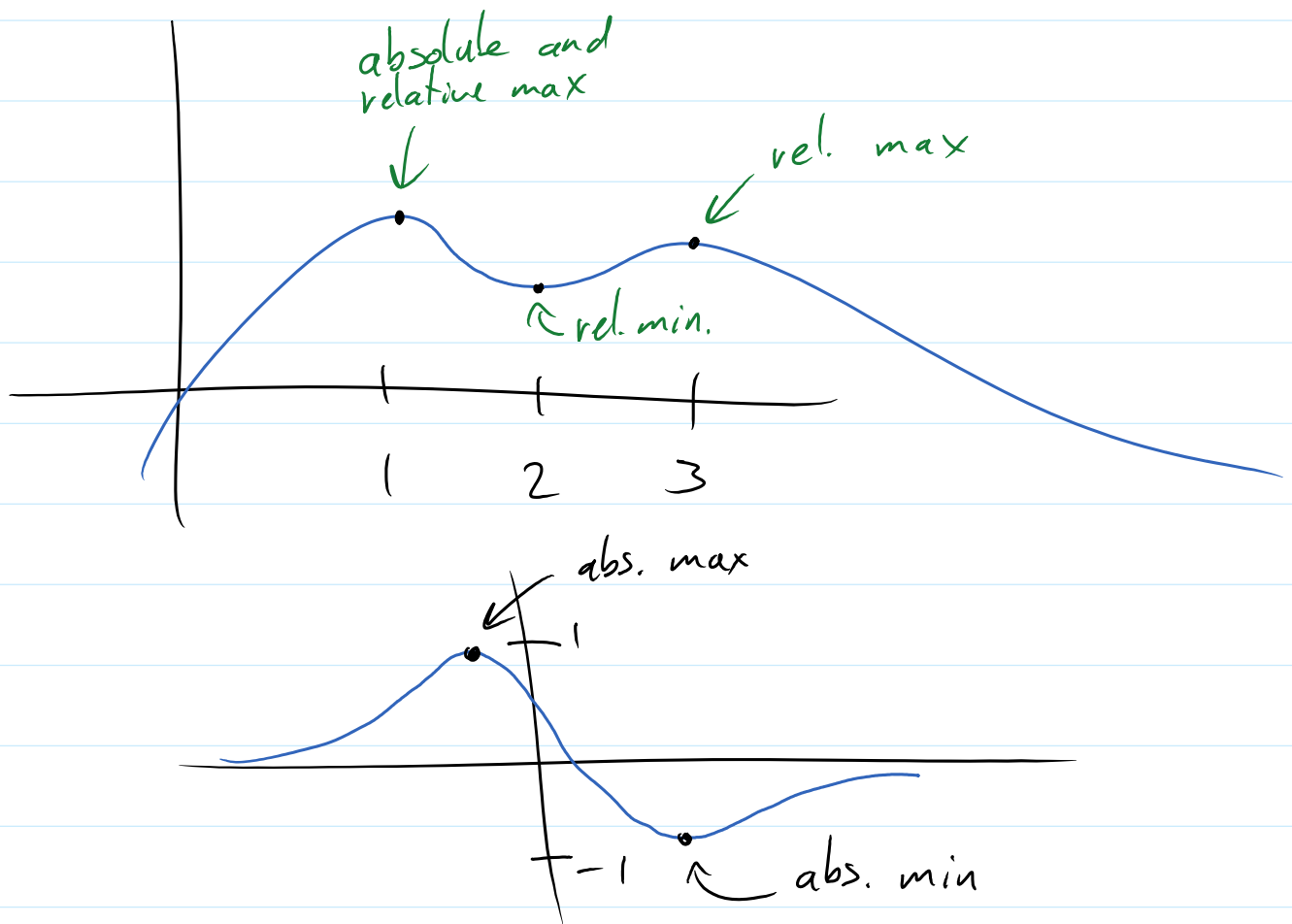


Online quiz on 3.3, 3.4, 3.5 due Monday 10/16.

## Section 3.4 - Optimization; Elasticity of demand



Thm: (The extreme value property)

A function  $f(x)$  that is continuous on the closed interval  $[a, b]$  attains absolute extremas on the interval. The absolute extrema are at

the relative extrema or the endpoints.

Ex: Find abs min/max:

$$f(x) = 2x^3 + 3x^2 - 12x - 7$$

① Find rel. min/max:

$$f'(x) = 0$$
$$6x^2 + 6x - 12 = 0$$
$$6(x^2 + x - 2) = 0$$
$$6(x-1)(x+2) = 0$$

$f'$	$(-\infty, -2)$	$(-2, 1)$	$(1, \infty)$
$(x-1)$	-	-	+
$(x+2)$	-	+	+
$f'$	+	-	+

Arrows indicate the sign of  $f'$  in each interval:  $(-\infty, -2)$  is positive,  $(-2, 1)$  is negative, and  $(1, \infty)$  is positive.

~~② Evaluate  $f(x)$  at the endpoints and rel. extremas (crit. numbers)~~

$x$	$f(x)$
-2	
1	

