Continuing Section 2.3: Continuity

Subject for this video: Positive and Negative Behavior of Graphs of Functions

This is prerequisite material, but it is very important for our course so it is worth a review.

Homework:

H20: Positive and Negative Behavior of Graphs of Functions (2.3#55,85)

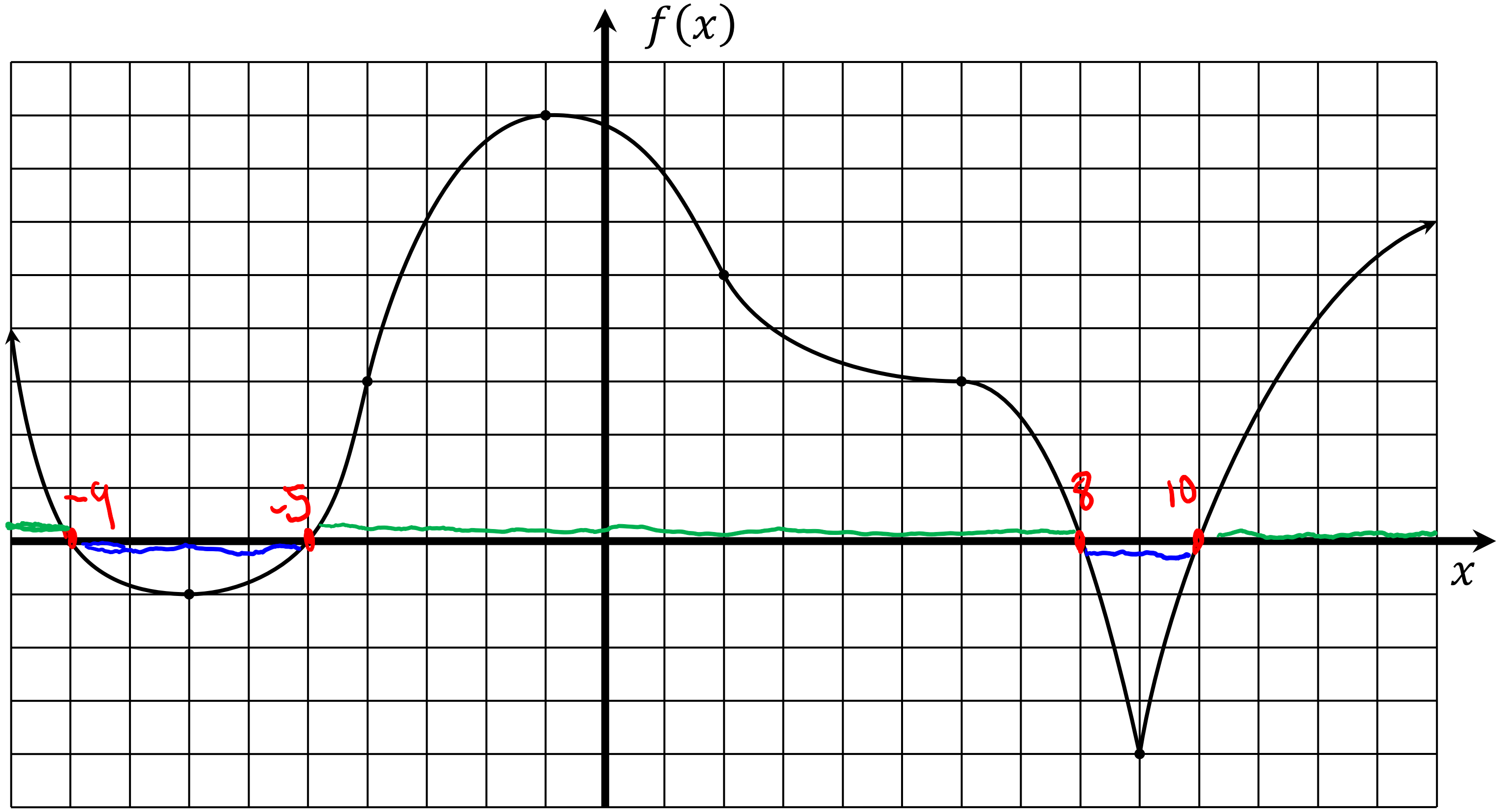
Recall definition of *positive* and *negative*.

To say a number y is positive means $y > 0$

To say y is negative means $y < 0$.

(The term non-negative means $y \geq 0$)

[Example 1] The graph of a function f is shown below.



(1) Where is $f(x) = 0$? Where is $y=0$? $x = -9, -5, 8, 10$

(2) Where is $f(x) > 0$? Express answers in interval notation. $(-\infty, -9) \cup (-5, 8) \cup (10, \infty)$

$y>0$ Graph is above the x axis

(3) Where is $f(x) < 0$? Express answers in interval notation. $(-9, -5) \cup (8, 10)$

$y<0$ Graph is below the x axis.

[Example 2] A function $f(x)$ is known to have the following properties

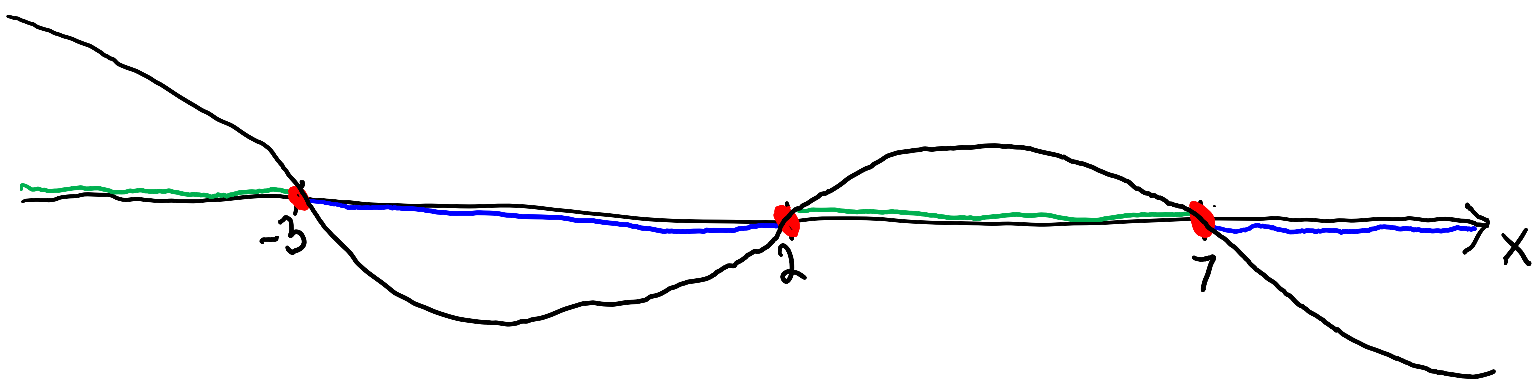
- f is continuous for all real numbers
- $f(x) > 0$ on $(-\infty,-3)$ and $(2,7)$
- $f(x) < 0$ on $(-3,2)$ and $(7,\infty)$

x intercepts are not mentioned.

(a) Sketch a possible graph of $f(x)$.

(b) Give the x coordinates of the x intercepts.

Start by indicating the positive & negative regions on a number line.



f is continuous, so the only way it can change from positive to negative is by touching the x axis and crossing it.

So x intercepts at $x=-3,2,7$

End of Video