**Topic:** Extrema and Intervals  

**What am I learning today?**

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### Warm-Up:

Warm-up: State the whether the functions are even or odd, positive or negative and the maximum number of turns possible:

1) $g(x) = -5x^4 + 7x^3 + 2x^2 - 7$

- **Degree:** Even (4)
- **LC:** Negative
- **Max # of turns:** 3

2) $f(x) = 3x^5 - 4x^4 + 6x + 1$

- **Degree:** Odd (5)
- **LC:** Negative
- **Max # of turns:** 2

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### Vocabulary

**Relative Extrema**

A relative minimum is the ordered pair that falls at the _bottom valley_ of any curve on the graph. (there can be **more** than ___)

A relative maximum is the ordered pair that falls at the _top peak_ of any curve on the graph. (there can be **more** than ___)

An absolute minimum is the _lowest_ ordered pair on a graph. (there could be **multiple**)

An absolute maximum is the _highest_ ordered pair on a graph. (there could be **multiple**)

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### Examples

- **Relative min:** (1, 1) **Relative max:** (4, 4)
- **Absolute min:** (1, 1) **Absolute max:** (7, 9)
- **Relative min:** (0, -1) **Relative max:** (5, 3)
- **Absolute min:** (0, -1) **Absolute max:** (7, 9)
**Topic:** Extrema and Intervals

**Vocabulary**

A function is **decreasing** if y-values decrease as x-values increase. (goes "down" from left to right)

A function is **increasing** if y-values increase as x-values increase. (goes "up" from left to right)

**Examples**

**Intervals of Increasing and Decreasing**

- Intervals of increasing: $(1, \infty)$
- Intervals of decreasing: $(-\infty, 1)$

- Intervals of increasing: $(-\infty, -4), (4, \infty)$
- Intervals of decreasing: $(-4, 4)$

- Intervals of increasing: $(-\infty, -5), (0, 1)$
- Intervals of decreasing: $(-5, 0), (1, \infty)$

**You Try!**

Extrema and Intervals with review concepts

- Relative Min: $(-2, 0)$, Relative Max: $(2, 0)$
- Absolute Min: $(-2, 0)$, Absolute Max: $(2, 0)$

Increase: odd, Decrease: even

LC: odd, Degree: even

X-Intercept(s): $(2, 0)$, Y-Intercept: $(0, 0)$

**Summary**

Summarize the lesson in your own words.