GUIDED NOTES: Extrema, Intervals for Increasing and Decreasing
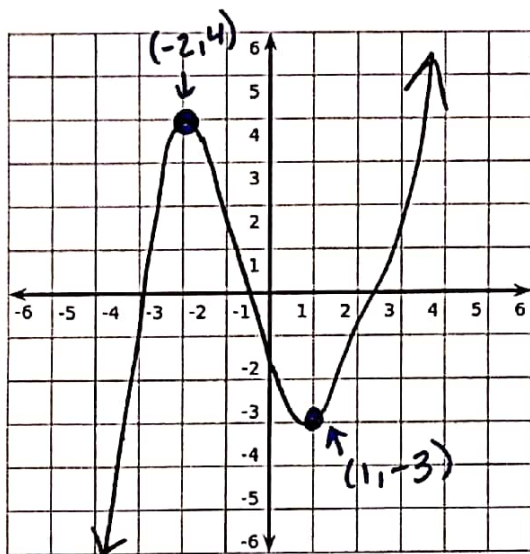
Extrema:

absolute minimum/maximum – absolutely the lowest/highest point the graph ever reaches

relative minimum/maximum – lowest/highest point in that area. Other points somewhere else on the graph are lower/higher.

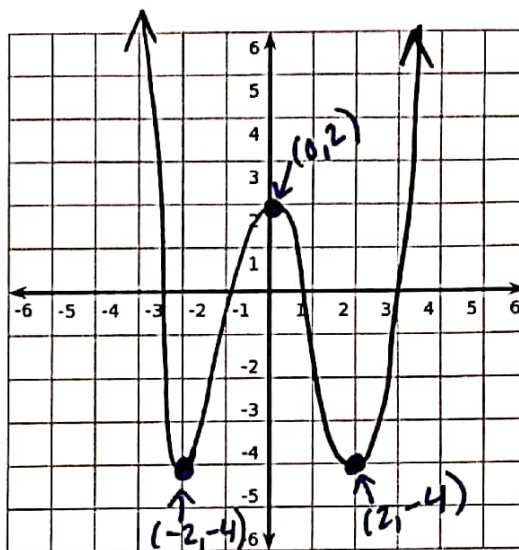For the following graphs, state the maximums and minimums and if they are absolute or relative.

EX1.

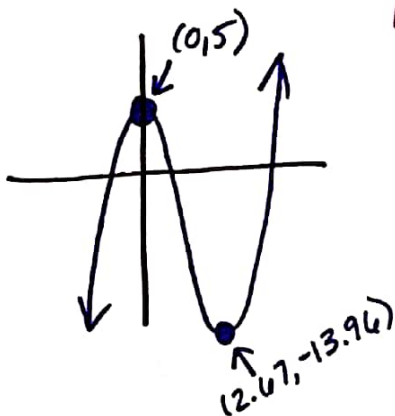
(-2,4) relative maximum

(1, -3) relative minimum

EX2.

(-2,-4) absolute minimum

(2,-4) absolute minimum

(0,2) relative maximum

EX3. $f(x) = 2x^3 - 8x^2 + 5$

2ND TRACE   3: minimum
~ or ~
4: maximum

Left Bound? Arrow to left of point, press ENTER
Right Bound? Arrow to right of point, press ENTER
Guess? Get close to point, press ENTER

(0,5) relative maximum
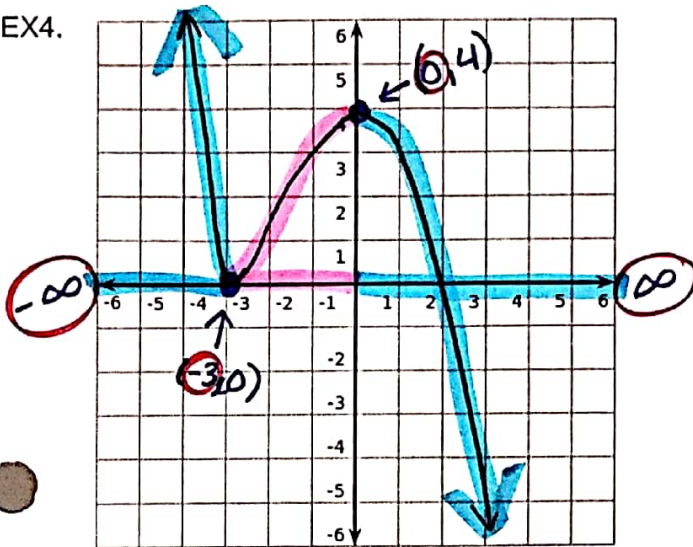(2.67, -13.96) relative minimum

Intervals for Increasing/Decreasing

Start by finding the extrema. Use the x-coordinates only to write the intervals!!

- increasing – graph is on a path upward

- decreasing – graph is on a path downward

State the intervals of increasing and the intervals of decreasing for the following graphs
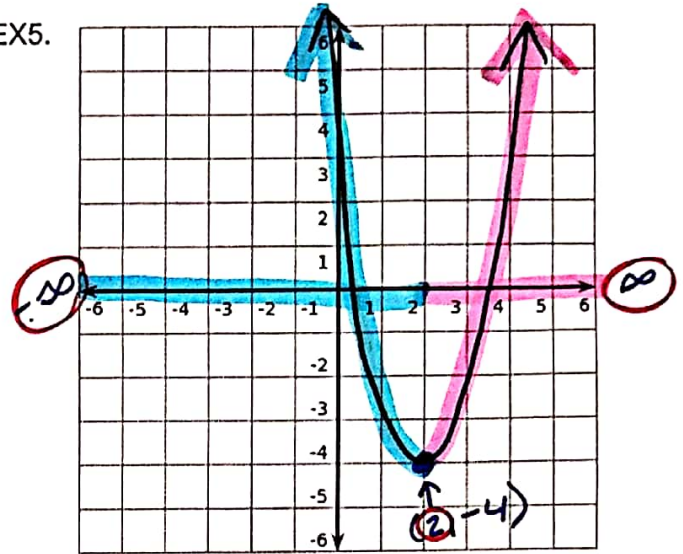
EX4.

$(0,4)$

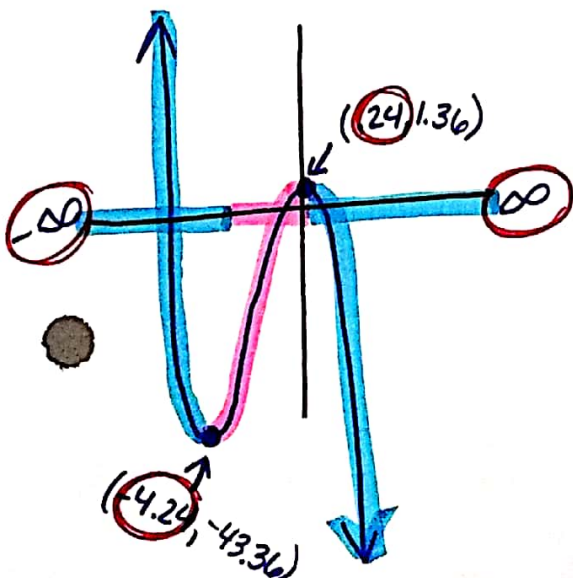$(-3,0)$

inc: $(-3, 0)$

dec: $(-\infty, -3)$ $(0, \infty)$

EX5.

$(2, -4)$

inc: $(2, \infty)$

dec: $(-\infty, 2)$

EX6. $f(x) = -x^3 - 6x^2 + 3x + 1$

$(.24, 1.36)$

$(-4.24, -43.36)$

inc: $(-4.24, .24)$

dec: $(-\infty, -4.24)$ $(.24, \infty)$

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