

TOPIC: INTRO TO EXTREMA

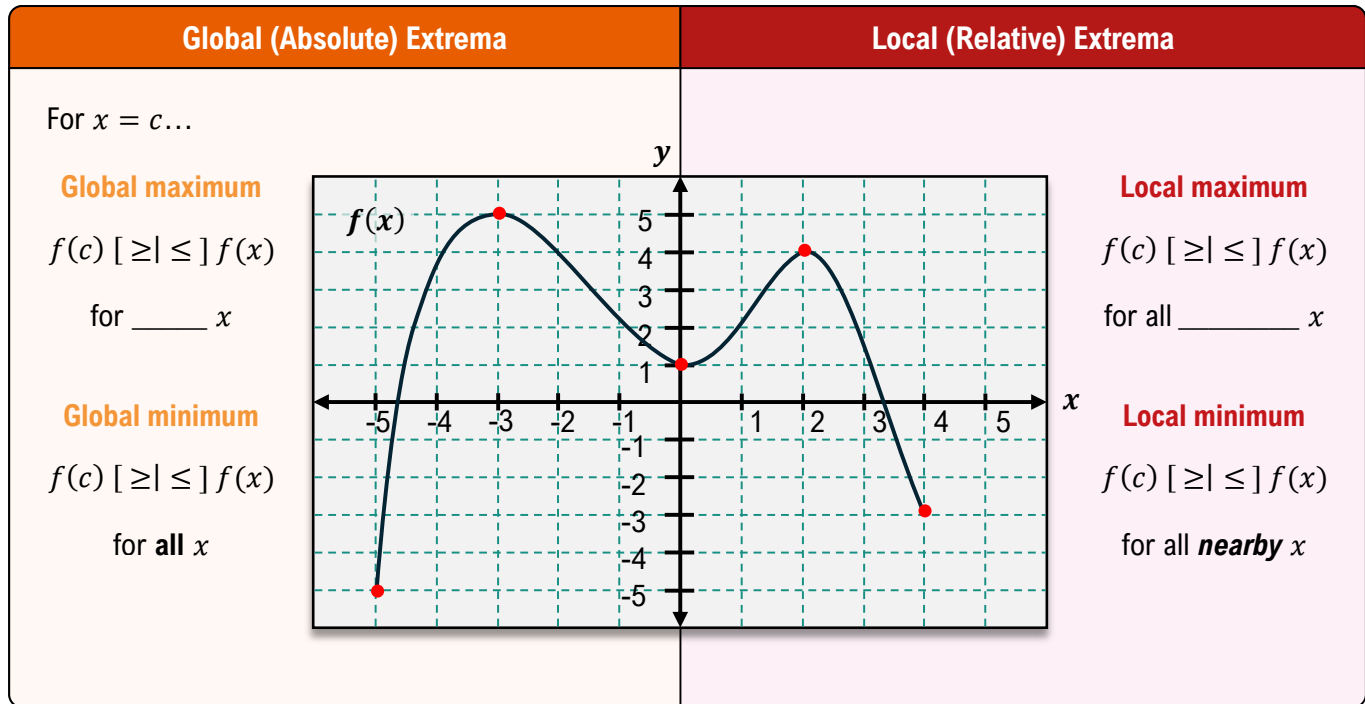
Finding Extrema Graphically

◆ Recall: Graphically, extrema (*maxima* & *minima*) occur at the *highest* & *lowest* points of a function.

► Extrema may be **global** (_____ function), **local** (_____ of function), or **both**.

EXAMPLE

Determine whether each labeled point is a global max/min, a local max/min, or none of these.

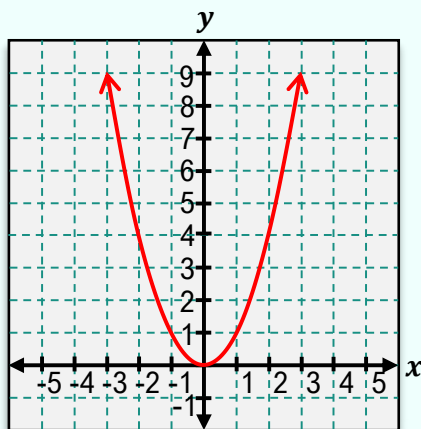


◆ Note: By the convention used **here**, endpoints can be global extrema, but NOT local.

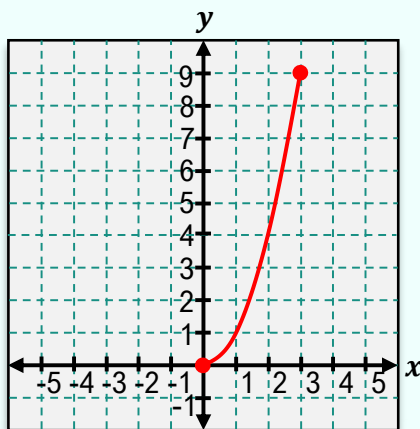
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EXAMPLE

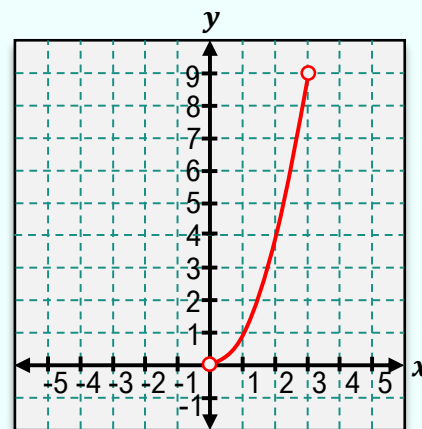
Locate the extreme values of the function $f(x)$ on the specified domain.



(A) Domain: $(-\infty, \infty)$



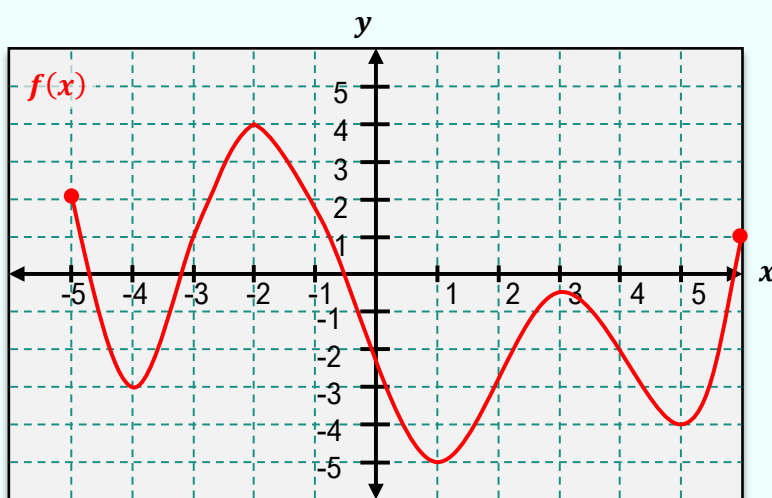
(B) Domain: $[0, 3]$



(C) Domain: $(0, 3)$

EXAMPLE

Label where the local & global maxima and minima occur on the given graph of $f(x)$.

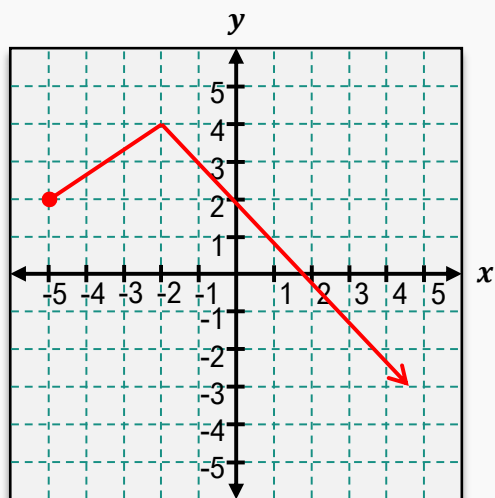


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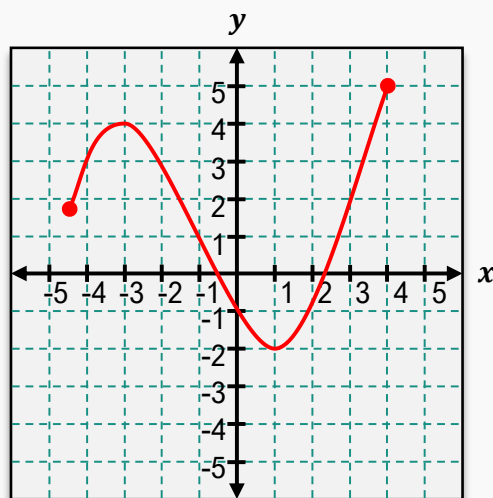
PRACTICE

Determine where the local and absolute maxima and minima occur on the given graph of $f(x)$.

(A)



(B)



EXAMPLE

Sketch a graph of $f(x)$ that is continuous over the interval $[-3, 2]$ and has the properties given below.

- ☐ Absolute maximum at $x = 2$
- ☐ Absolute minimum at $x = 0$
- ☐ Local maximum at $x = -2$

