

Exercise walk-through

5.5

Using the Candidates Test to Determine Absolute (Global) Extrema

AP Calculus BC

You must be able to

- find the **absolute (global) extrema** on a closed interval

1

The method

Method — The Candidates Test

On a closed interval $[a, b]$, evaluate f at **all critical points and both endpoints**. The largest value is the absolute maximum; the smallest is the absolute minimum.

Exercises 2.1-2.3

2.1 State what to evaluate for absolute extrema on $[a, b]$. [1]

2.2 For $f(x) = x^2$ on $[-1, 3]$, list the candidate inputs. [2]

2.3 State how to pick the absolute maximum. [1]

Exercises 2.1·2.3

2.1 State what to evaluate for absolute extrema on $[a, b]$. [1]

2.1

- f at all critical points and the two endpoints
-

2.2 For $f(x) = x^2$ on $[-1, 3]$, list the candidate inputs. [2]

2.2

- $x = -1, x = 0, x = 3$
-

2.3 State how to pick the absolute maximum. [1]

2.3

- the largest of the candidate values

Exercises 3.1·3.2

3.1 To find absolute extrema on $[a, b]$, evaluate f at

[1]

☐

A only the endpoints

B the critical points and endpoints

C only the critical points

D $x = 0$

☐

3.2 The absolute maximum is the

[1]

A smallest candidate value

B largest candidate value

C midpoint

D average

Exercises 3.1-3.2

3.1 To find absolute extrema on $[a, b]$, evaluate f at

[1]

☐

A only the endpoints

B the critical points and endpoints

C only the critical points

D $x = 0$

3.1 B

- the critical points and endpoints.

3.2 The absolute maximum is the

[1]

☐

A smallest candidate value

B largest candidate value

C midpoint

D average

3.2 B

- largest candidate value.

Exercise 3.3 (a)

3.3 $f(x) = x^2$ on $[-1, 3]$.

(a) State the critical point.

[1]

Exercise 3.3 (a)

3.3 $f(x) = x^2$ on $[-1, 3]$.

(a) State the critical point.

[1]

(a)

- $x = 0$

Exercise 3.3 (b)

3.3 $f(x) = x^2$ on $[-1, 3]$.

(b) Evaluate at the candidates $-1, 0, 3$.

[1]

Exercise 3.3 (b)

3.3 $f(x) = x^2$ on $[-1, 3]$.

(b) Evaluate at the candidates $-1, 0, 3$.

[1]

(b)

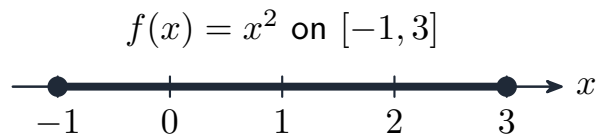
- $f(-1) = 1, f(0) = 0, f(3) = 9$

Exercise 3.3 (c)

3.3 $f(x) = x^2$ on $[-1, 3]$.

(c) State the absolute maximum.

[1]

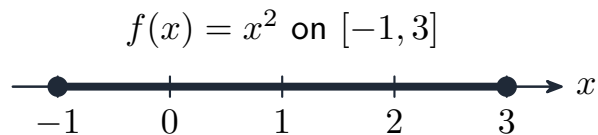


Exercise 3.3 (c)

3.3 $f(x) = x^2$ on $[-1, 3]$.

(c) State the absolute maximum.

[1]



(c)

- 9