AP CALCULUS AB • EXERCISE SHEET

5.5 The Candidates Test for Absolute Extrema

Name: _____ Class: _____ Date: _____ **Total: 9 marks**

KEY WORDS absolute (global) extrema 绝对极值 • critical point 临界点

Objective

Build the skills to answer exam questions on **the Candidates Test for absolute extrema**.

You must be able to:

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

1 Worked examples

Study these first. Each one shows the method for a question type used later.

■ 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.

■ Example

$f(x) = x^2$ on $[-1, 3]$: critical point $x = 0$; candidates $f(-1) = 1$, $f(0) = 0$, $f(3) = 9$; absolute max 9, absolute min 0.

2 Practice

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]

3 Exam-style questions

3.1 To find absolute extrema on $[a, b]$, evaluate f at [1]

A B
C D

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 B
C D

A smallest candidate value
B largest candidate value
C midpoint
D average

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

(a) State the critical point. [1]

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

(c) State the absolute maximum. [1]