

Exercise walk-through

Exploring Types of Discontinuities ■ 1.10

eXercise

You must be able to

- classify a **discontinuity** 不连续点 as removable, jump, or infinite

Method — Three types of discontinuity

- **removable** (a **hole**): the limit exists but $\neq f(a)$, or $f(a)$ is undefined;
- **jump**: the left and right limits differ;
- **infinite**: a vertical asymptote (the function blows up).

Practice 2.1 ■ 1 mark

Name the three types of discontinuity.

Solution 2.1

Method: Three types of discontinuity

Worked steps

removable, jump, and infinite **B1**.

Practice 2.2 ■ 1 mark

State which type is a “hole”.

Solution 2.2

Worked steps

removable **B1**.

Practice 2.3 ■ 2 marks

State which type occurs at a vertical asymptote.

Solution 2.3

Method: Three types of discontinuity

Worked steps

infinite **B1** **B1**.

Exam-style 3.1 ■ 1 mark

A discontinuity where the left and right limits differ is a

A removable discontinuity

B jump discontinuity

C infinite discontinuity

D point of continuity

Solution 3.1

Method: Three types of discontinuity

A removable discontinuity

B jump discontinuity 

C infinite discontinuity

D point of continuity

Worked steps

B.

Exam-style 3.2 ■ 1 mark

A hole in a graph is a

- A** jump discontinuity
- B** removable discontinuity
- C** infinite discontinuity
- D** point of continuity

Solution 3.2

- A jump discontinuity
- B removable discontinuity**
- C infinite discontinuity
- D point of continuity



Worked steps

B.

Exam-style 3.3 ■ 1 mark

Classify each.

- (a) A vertical asymptote.
- (b) A single missing point.
- (c) A step where the graph jumps.

Solution 3.3

Method: Three types of discontinuity

Worked steps

(a) infinite **B1**. (b) removable **B1**. (c) jump **B1**.