

# 3.5 Selecting Procedures for Calculating Derivatives

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_ Total: 9 marks

KEY WORDS chain rule 链式法则

## Objective

Build the skills to answer exam questions on **selecting procedures for calculating derivatives**.

You must be able to:

- recognise the structure of an expression and pick the right rule (power, product, quotient, chain)

## 1 Worked examples

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

### ■ Choosing a rule

- a power of  $x \rightarrow$  **power rule**;
- a product  $\rightarrow$  **product rule**;
- a quotient  $\rightarrow$  **quotient rule**;
- a composite (function of a function)  $\rightarrow$  **chain rule**.

Combine them when an expression mixes structures.

## 2 Practice

2.1 State which rule to use for a composite. [1]

2.2 State which rule to use for a product. [1]

2.3 For  $y = x^2 \sin x$ , name the rule. [2]

## 3 Exam-style questions

3.1 For  $y = (x^2 + 1)^5$ , use the [1]

- |   |   |
|---|---|
| A | B |
| C | D |
- A quotient rule  
B chain rule  
C product rule only  
D no rule

3.2 For  $y = \frac{x}{x+1}$ , use the [1]

- |   |   |
|---|---|
| A | B |
| C | D |
- A power rule  
B quotient rule  
C chain rule  
D sum rule

3.3 Name the rule for each.

- (a)  $y = x^3$ . [1]  
(b)  $y = x e^x$ . [1]  
(c)  $y = \sin(x^2)$ . [1]