

## 2.6 Constant, Sum, Difference, and Constant Multiple Rules

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

Total: 9 marks

**KEY WORDS** constant multiple 常数倍 • constant multiple rule 常数倍法则 • sum/difference rule 和差法则  
• derivative 导数

### Objective

Build the skills to answer exam questions on **the constant, sum, difference, and constant multiple rules**.

You must be able to:

- apply the **constant multiple rule** 常数倍法则 and **sum/difference rule** 和差法则

### 1 Worked examples

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

#### ■ Basic derivative rules

- **constant multiple:**  $\frac{d}{dx}[c f] = c f'$ ;
- **sum / difference:**  $\frac{d}{dx}[f \pm g] = f' \pm g'$ ;
- **constant:**  $\frac{d}{dx}[c] = 0$ .

#### ■ Example

$$\frac{d}{dx}[4x^3 - 2x] = 12x^2 - 2.$$

### 2 Practice

2.1 State the sum rule. [1]

2.2 Differentiate  $3x^2$ . [1]

**2.3** Differentiate  $x^3 + x$ . [2]

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### 3 Exam-style questions

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**3.1**  $\frac{d}{dx}[5x^2]$  equals [1]

- **A**  $5x$
  - **B**  $10x$
  - **C**  $5x^2$
  - **D**  $10x^2$
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**3.2**  $\frac{d}{dx}[f + g]$  equals [1]

- **A**  $f' \cdot g'$
  - **B**  $f' + g'$
  - **C**  $f' - g'$
  - **D**  $fg$
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**3.3**  $y = 4x^3 - 2x$ .

(a) Differentiate  $4x^3$ . [1]

(b) Differentiate  $-2x$ . [1]

(c) State  $y'$ . [1]

## Solutions

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**2.1**  $\frac{d}{dx}[f + g] = f' + g'.$

**2.2**  $6x.$

**2.3**  $3x^2 + 1.$

**3.1** B.

**3.2** B.

**3.3** (a)  $12x^2.$  (b)  $-2.$  (c)  $y' = 12x^2 - 2.$