

Exercise walk-through

Derivative Rules: Constant, Sum, Difference, and Constant Multiple ■ 2.6

eXercise

You must be able to

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

Method — Basic derivative rules

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

Method — Example

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

Practice 2.1 ■ 1 mark

State the sum rule.

Solution 2.1

Worked steps

$$\frac{d}{dx}[f + g] = f' + g' \quad \text{B1}.$$

Practice 2.2 ■ 1 mark

Differentiate $3x^2$.

Solution 2.2

Worked steps

$6x$ **B1**.

Practice 2.3 ■ 2 marks

Differentiate $x^3 + x$.

Solution 2.3

Worked steps

$$3x^2 + 1 \quad \text{B1} \quad \text{B1}.$$

Exam-style 3.1 ■ 1 mark

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

A $5x$

B $10x$

C $5x^2$

D $10x^2$

Solution 3.1

A $5x$

B $10x$



C $5x^2$

D $10x^2$

Worked steps

B.

Exam-style 3.2 ■ 1 mark

$\frac{d}{dx}[f + g]$ equals

A $f \cdot g'$

B $f' + g'$

C $f' - g'$

D fg

Solution 3.2

A $f \cdot g'$

B $f + g'$



C $f - g'$

D fg

Worked steps

B.

Exam-style 3.3 ■ 1 mark

$$y = 4x^3 - 2x.$$

- (a) Differentiate $4x^3$.
- (b) Differentiate $-2x$.
- (c) State y' .

Solution 3.3

Worked steps

(a) $12x^2$ **B1**. (b) -2 **B1**. (c) $y' = 12x^2 - 2$ **B1**.