

3.1 Periodic Phenomena

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

KEY WORDS period 周期 • amplitude 振幅 • midline 中线 • periodic 周期性 • cycle 周期段

Objective

Build the skills to answer exam questions on **periodic phenomena**.

You must be able to:

- identify the **period** 周期, **amplitude** 振幅, and **midline** 中线 of a periodic function

1 Worked examples

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

■ Periodic functions

A **periodic** function repeats every **period** P (the length of one cycle). Its:

- **amplitude** $= \frac{\text{max} - \text{min}}{2}$;
- **midline** $= \frac{\text{max} + \text{min}}{2}$ (the horizontal centre).

■ Example

Max 8, min 2: amplitude = 3, midline = 5.

2 Practice

2.1 Define the period of a periodic function. [1]

2.2 State how the amplitude relates to the max and min. [1]

2.3 A wave has max 8 and min 2. Find the amplitude and midline. [2]

3 Exam-style questions

3.1 The period of a periodic function is [1]

- | | |
|---|---|
| A | B |
| C | D |
- A its height
B the length of one cycle
C its maximum
D its slope

3.2 The amplitude equals [1]

- | | |
|---|---|
| A | B |
| C | D |
- A $\text{max} - \text{min}$
B $\frac{\text{max} - \text{min}}{2}$
C $\frac{\text{max} + \text{min}}{2}$
D max

3.3 A tide has maximum height 6 m and minimum 0 m, repeating every 12 h.

(a) Find the amplitude. [1]

(b) Find the midline. [1]

(c) State the period. [1]