AP MICROECONOMICS • EXERCISE SHEET

3.2 Short-Run Production Costs

Name: _____ Class: _____ Date: _____ **Total: 10 marks**

Objective

Build the skills to answer exam questions on **short-run production costs**.

You must be able to:

- distinguish **fixed costs** 固定成本 from **variable costs** 可变成本
- calculate **total cost**, **average fixed cost**, **average variable cost**, and **average total cost**
- calculate **marginal cost** 边际成本 as the change in total cost per extra unit
- explain why MC cuts AVC and ATC at their minimum points

1 Worked examples

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

■ **Cost types**

Fixed costs do not change with output; **variable costs** do. $TC = FC + VC$.

■ **Average costs**

$AFC = \frac{FC}{Q}$, $AVC = \frac{VC}{Q}$, $ATC = \frac{TC}{Q}$.

■ **Marginal cost**

$MC = \frac{\Delta TC}{\Delta Q}$. The MC curve cuts both AVC and ATC at their **minimum** points: while MC is below an average, the average falls; above it, it rises.

2 Practice

2.1 State the difference between fixed and variable costs. [2]

2.2 At $Q = 10$, fixed cost is \$100 and variable cost is \$150. Find the average total cost. [2]

2.3 State the point on the ATC curve where the MC curve crosses it. [1]

3 Exam-style questions

3.1 Average total cost is [1]

- **A** $TC \times Q$
- **B** TC/Q
- **C** $MC \times Q$
- **D** FC/Q

3.2 The MC curve crosses the ATC curve at ATC's [1]

- **A** maximum
- **B** minimum
- **C** starting point
- **D** end point

3.3 A firm's total cost rises from \$200 (at $Q = 20$) to \$215 (at $Q = 21$).

(a) Find the marginal cost of the 21st unit. [1]

(b) Find the average total cost at $Q = 20$. [1]

(c) Since MC exceeds ATC here, state whether ATC is rising or falling. [1]

4 Go further

- work through the **3.2 Short-Run Production Costs** lesson on the **Learn** page;
- read the **Production, Cost, and the Perfect Competition Model** section of the AP Microeconomics handout on the **Know** page.

Solutions

2.1 fixed costs do not change with output; variable costs rise as output rises.

2.2 $TC = 100 + 150 = 250$; $ATC = \dfrac{250}{10} = \$25$.

2.3 at its minimum point.

3.1 B.

3.2 B.

3.3 (a) $MC = \dfrac{215 - 200}{1} = \$15$. (b) $ATC = \dfrac{200}{20} = \$10$. (c) rising (MC is above ATC).