

Exercise walk-through

Introduction to Factor Markets ■ 5.1

eXercise

You must be able to

- explain that the demand for a **factor of production** is a **derived demand** 派生需求
- calculate the **marginal revenue product (MRP)** 边际收益产品
- calculate the **marginal factor cost (MFC)** 边际要素成本
- state the profit-maximizing hiring rule: employ a factor until $MRP = MFC$

Method — Derived demand

A firm demands a factor (like labour) only because of the demand for the **good it helps produce**.

Method — MRP and MFC

$MRP = MP \times \text{price of the good}$ — the extra revenue from one more unit of the factor.
 MFC is the extra cost of hiring one more unit (the wage, in a competitive factor market).

Method — Hiring rule

Hire until $MRP = MFC$. The factor demand curve is the firm's **MRP** curve.

Practice 2.1 ■ 1 mark

State what “derived demand” means for a factor of production.

Solution 2.1

Method: Derived demand

Worked steps

the demand for it comes from the demand for the good it helps produce **B1**.

Practice 2.2 ■ 2 marks

A worker's marginal product is 5 units, and each unit sells for \$4. Find the worker's MRP.

Solution 2.2

Worked steps

$$MRP = MP \times P = 5 \times 4 = \$20 \quad \text{M1} \quad \text{A1}.$$

Practice 2.3 ■ 1 mark

State the profit-maximizing hiring rule.

Solution 2.3

Method: Hiring rule

Worked steps

hire the factor until its marginal revenue product equals its marginal factor cost **B1**.

Exam-style 3.1 ■ 1 mark

The marginal revenue product of labour is

A marginal product $\times$ price

B the wage

C total revenue

D marginal cost

Solution 3.1

A marginal product $\times$ price



B the wage

C total revenue

D marginal cost

Worked steps

A.

Exam-style 3.2 ■ 1 mark

A firm hires labour until

A $MRP > MFC$

B $MRP = MFC$

C $MRP < MFC$

D the wage is zero

Solution 3.2

A $MRP > MFC$

B $MRP = MFC$



C $MRP < MFC$

D the wage is zero

Worked steps

B.

Exam-style 3.3 ■ 1 mark

A worker adds 8 units of output, each selling for \$5; the wage is \$30.

- (a) Find the worker's MRP.
- (b) State whether the firm should hire this worker.
- (c) Explain why.

Solution 3.3

Method: Hiring rule

Worked steps

(a) $MRP = 8 \times 5 = \$40$ **B1**. (b) yes, hire the worker **B1**. (c) the MRP (\$40) exceeds the wage (\$30), so the worker adds more revenue than cost **B1**.