

Answer #1

K	L Q	MPk	APK	APL	VMPk	
0	20	0	NA	NA	NA	NA
1	20	50	50	50.0	2.5	200
2	20	150	100	75.0	7.5	400
3	20	300	150	100.0	15	600
4	20	400	100	100.0	20	400
5	20	450	50	90.0	22.5	200
6	20	475	25	79.2	23.75	100
7	20	475	0	67.9	23.75	0
8	20	450	-25	56.3	22.5	-100
9	20	400	-50	44.4	20	-200
10	20	300	-100	30.0	15	-400
11	20	150	-150	13.6	7.5	-600

(a) Labor is fixed input and capital is variable input

answer: Option (A)

(b) Wage rate is \$30 per hour

labor is fixed at 20 hours

fixed cost = $(\$30) * (20)$

Fixed cost = \$600

Answer: \$600

(c) 7 Units of capital are required to produce 475 units of output. The capital rental rate is \$25.

The variable cost of producing 475 units of output = $(\$25) * (7)$

The variable cost of producing 475 units of output = \$175

Answer: \$175

(d) the number of capital which maximizes the profit occurs at the point where MPk = rental rate

MPk = rental rate = \$25 corresponding to 6 units of capital.

Answer: 6 units

(e) 6 units of capital with 20 units of labor are producing 475 units of output.

variable cost = $(\$25) (6) = \150

Fixed cost = \$600

Total cost of producing 475 units = $\$150 + \$600 = \$750$

Total revenue from 475 units = $(475) * (\$4) = \1900

Profit = TR - TC

Profit = $\$1900 - \600

Profit = \$1300

answer: \$1300

(f) Increasing marginal returns exist from 1 unit of capital to 4 units of capital.

the MPk is increasing between 1 unit to 4 units of capital

(g) decreasing marginal returns exist from 5 units of capital to 7 units of capital.
In this range, MPk is decreasing but remains positive.

Answer 2#

The firm should decrease the amount of capital used.

Explanation:

The wage rate is \$12 per hour and capital is rented at \$8 per hour.

The marginal product of labor is 60 units of output per hour and the marginal product of capital is 45 units of output per hour.

A manager hires labor and rents capital equipment in a very competitive market.

The ratio of marginal product of labor and wage rate

$$= 60/12$$

$$= 5$$

The ratio of marginal product of capital and rent

$$= 45/8$$

$$= 5.625$$

Since the ratio is greater for capital, it means that the manager should decrease the amount of capital used in the production process.