

Acme Widget Inc. Production Function

Name

University Affiliation

**Acme Widget Inc. Production Function**

Number of workers	Number of Widgets Produced	Marginal Product (MPN)	Marginal Revenue Product (MRPN (P=\$5))
0	0	-	-
1	8	8	40
2	15	7	35
3	21	6	30
4	26	5	25
5	30	4	20
6	33	3	15

1. Marginal product is the change in production caused by an increase in one extra worker denoted as MPN. Marginal revenue product is the amount of revenue generated for hiring an additional worker, which is given by multiplying MPN by revenue generated by each unit produced.
  - i. At nominal wage of \$38, Acme Widget should hire only one worker because marginal revenue product is \$40. If they decide to hire more than one worker the cost of hiring a new worker will be higher than the revenue generated after hiring the new worker.
  - ii. At nominal wage of \$27, Acme Widget should hire three workers because marginal revenue product is \$30. If they decide to hire more than three workers

the cost of hiring a new worker will be higher than the revenue generated after hiring the new worker.

- iii. At nominal wage of \$22, Acme Widget should hire four workers because marginal revenue product is \$25. If they decide to hire more than four workers the cost of hiring a new worker will be higher than the revenue generated after hiring the new worker.

2. Marginal product of a firm is  $MPN=50-N$

N is number of hours used for production

Output price is \$2 per unit

- a. At \$10 per hour, how many hours does the firm require?

Marginal revenue should be equals to marginal cost per hour.

Therefore, \$10 per hour =  $MRPN=(50-N)^2$

$$10=(50-N)^2$$

$$10/2=50-N$$

$$5=50-N$$

$$N=50-5$$

$$N=45$$

The number of hours required by the firm at cost of \$10 per hour is 45 hours.

- b. At \$12 per hour, how many hours does the firm require?

Marginal revenue should be equals to marginal cost per hour.

Therefore, \$12 per hour =  $MRPN=(50-N)^2$

$$12=(50-N)^2$$

$$12/2=50-N$$

$$6=50-N$$

$$N=50-6$$

$$N=44$$

The number of hours required by the firm at cost of \$12 per hour is 44 hours.

c. Wage elasticity

Elasticity of demand is given by change in quantity divided by change in price.

$$= (46-45) / (12-10)$$

$$= 1/2$$

$$= 0.5$$

The wage elasticity of labour demand for is inelastic because it is less than 1.

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