

2.4: End of Chapter Problems

Problem #1

Billco Windows and Doors is preparing their monthly productivity report. Their monthly costs are shown below. Calculate the **a)** labour productivity (output / labour hours), **b)** machine productivity (output / machine hours), and **c)** the multifactor productivity (output / labour cost + material cost + energy cost) of dollars spent on labour, materials, and energy. Average labour rate is \$18.00.

Units produced: 1800

Labour hours: 1975

Machine hours: 425

Materials cost: \$81000

Energy cost: \$21600

Solution

a) Labour productivity (output / labour hours)

$$= 1800 / 1975$$

$$= .91 \text{ units per labour hour}$$

b) Machine productivity (output / machine hours)

$$= 1800 / 425$$

$$= 4.23 \text{ units per machine hour}$$

c) Multifactor productivity (output / labour cost + material cost + energy cost)

$$= 1800 / (1975 \times \$18 + \$81000 + \$21600)$$

$$= .013 \text{ units per dollar spent}$$

Problem #2

A company makes seasonal jams and jellies. Yesterday they produced 420 jars of jam with five workers who each worked an 8-hour day. What was the labour productivity?

Solution

$$= 420 / (5 \text{ workers} \times 8 \text{ hours})$$

$$= 10.5 \text{ jars per worker hour}$$

Problem #3

A greeting card company manufactured 3500 cards in one day. Labour cost was \$1200, material cost was \$90, and overhead was \$450. What is the multifactor productivity?

Solution

$$= 3500 / (\$1200 + \$90 + \$450)$$

$$= 2.01 \text{ cards per dollar of input}$$

Problem #4

Joe has purchased a pizza franchise and is learning how to measure productivity. Calculate the **a)** food cost productivity, **b)** labour productivity, and **c)** total productivity. Also calculate the percent change for each measure.

	June	July
Sales	\$52500	\$59650
Food cost	\$15750	\$16702
Labour cost	\$11550	\$14912
Overhead cost	\$3500	\$3500

Solution

	June	July	% Change
a) Food cost productivity	$52500 / 15750$ = \$3.33	$59650 / 16702$ = \$3.57	$(3.57 - 3.33) / 3.33 \times 100$ = +7.21%
b) Labour productivity	$52500 / 11550$ = \$4.55	$59650 / 14912$ = \$4.00	$(4.00 - 4.55) / 4.55 \times 100$ = -12.09%
c) Total productivity	$52500 / (15750 + 11550 + 3500)$ = \$1.70	$59650 / (16702 + 14912 + 3500)$ = \$1.70	$(1.70 - 1.70) / 1.70 \times 100$ = 0%

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