AP® Microeconomics
2003 Sample Student Responses
Form B
Write in the box the number of the question you are answering on this page as it is designated in the examination.

a) Profit-maximizing number of workers occurs when \( \frac{MRP_{\text{Labor}}}{P} = 1 \). Hence, a firm will maximize its at \( MRP_{\text{Labor}} = \text{wage rate} \).

b) # of workers | output (dozens) | MP | P | MRP
---|---|---|---|---
0 | 0 | | | 8 \times 2 = 16
1 | 8 | | | 7 \times 2 = 14
2 | 15 | | | 6 \times 2 = 12
3 | 21 | | | 5 \times 2 = 10
4 | 26 | | | 4 \times 2 = 8
5 | 30 | | | 3 \times 2 = 6
6 | 33 | | | 2 \times 2 = 4
7 | 35 | | | 1 \times 2 = 2
8 | 36 | | | 1 \times 2 = 2

To maximize profits, Leadmill should hire workers to the point where \( \frac{MRP_{\text{Labor}}}{P} = 1 \).

Hence, \( \frac{MRP_{\text{Labor}}}{P} = 1 \), so \( MRP_{\text{Labor}} \) should equal 8. This is reached by hiring up through to the fifth worker, so Leadmill should employ 5 workers.
Write in the box the number of the question you are answering on this page as it is designated in the examination.

\[ 3 \]

(c) \( MR_L = 1 \), \( MR_L = 1 \), so \( \frac{MR_L}{P_L} \) maximization occurs when \( MR_L = 6 \). This occurs with the hiring of the 6th worker, so Leadmill should hire 6 workers.

d) \begin{tabular}{|c|c|c|c|c|}
\hline
\# of workers & output & MP & P & \( MR_L \) \\
\hline
0 & 0 & & & \ \\
1 & 8 & 8 & 1 & 8 \\
2 & 15 & 7 & 1 & 7 \\
3 & 21 & 6 & 1 & 6 \\
4 & 26 & 5 & 1 & 5 \\
5 & 30 & 4 & 1 & 4 \\
6 & 33 & 3 & 1 & 3 \\
7 & 35 & 2 & 1 & 2 \\
8 & 36 & 1 & 1 & 1 \\
\hline
\end{tabular}

\( MR_L = 1 \), \( MR_L = 1 \), hence \( \frac{MR_L}{P_L} \) maximization occurs when \( MR_L = 6 \). This occurs with the hiring of the third worker, hence Leadmill would employ 3 workers.
Write in the box the number of the question you are answering on this page as it is designated in the examination.

(a) + (b) combined

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Where MR = MC

profit-maximizing

Number of workers

4 to 5 workers

(b)
Write in the box the number of the question you are answering on this page as it is designated in the examination.

(d)

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