Solving the Problems

$$
\begin{gathered}
Q=50-P \\
T C=5 Q
\end{gathered}
$$

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## The Answers

- Suppose
$Q=50-P$ $T C=5 Q$

| Q | 22.5 |
| :---: | ---: |
| $P$ | $\$ 27.50$ |
| Revenue | $\$ 618.75$ |
| Cost | $\$ 112.50$ |
| Profit | $\$ 506.25$ |

Solving the Problems

## Solving Problem I

- Find the value of Q at which $\mathrm{MR}=\mathrm{MC}$
- Find MC
- Find MR


## The Detailed Solution

- Find the value of Q at which $\mathrm{MR}=\mathrm{MC}$

| Solving Problem I |
| :---: |
| • Find the value of Q at which $\mathrm{MR}=\mathrm{MC}$ |
| • Find MC |
| • Find MR |
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| Soling the Problems |


| Marginal Cost If $T C=5 Q, M C=5$ |  |
| :---: | :---: |

## Marginal Revenue

- Find the value of Q at which $\mathrm{MR}=\mathrm{MC}$
- Find MC
- Find MR

Solve for the inverse demand function Substitute for P into the revenue function

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The Inverse Demand Function

$$
\begin{aligned}
& Q=50-P \\
& P=50-Q
\end{aligned}
$$

## The Revenue Function

$$
\begin{gathered}
Q=50-P \\
P=50-Q \\
R=P Q=(50-Q) Q
\end{gathered}
$$

$$
R=50 Q-Q^{2}
$$

## Finding Marginal Revenue

- The derivative of

$$
a x^{2}+b x+c
$$

is

$$
2 a x+b
$$

## Finding Marginal Revenue

- The derivative of

$$
a x^{2}+b x+c
$$

is
$2 a x+b$
$50 Q-Q^{2}$

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- $\mathrm{MC}=5$
- $M R=50-2 \mathrm{Q}$

$$
50-2 Q=5
$$

Finding P

- Since
$Q=50-P$
$P=27.5$

| Finding P |  |  |
| :---: | :---: | :---: |
| - Since$\begin{gathered} Q=50-P \\ P=27.5 \end{gathered}$ | Q | 22.5 |
|  | $P$ | \$27.50 |
|  | Revenue | \$618.75 |
|  | Cost | \$112.50 |
|  | Profit | \$506.25 |
| KENTSTATE | the Probems |  |

Find $M R=M C$

- $\mathrm{MC}=5$
- $\mathrm{MR}=50-2 \mathrm{Q}$

$$
\begin{gathered}
50-2 Q=5 \\
Q=22.5
\end{gathered}
$$

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| Revenue |  |  |
| :---: | :---: | :---: |
| Revenue $=P Q$ | Q | 22.5 |
|  | P | \$27.50 |
|  | Revenue | \$618.75 |
|  | Cost | \$112.50 |
|  | Profit | \$506.25 |
| KENTSTATE | ne Problems |  |


| Cost |  |  |
| :---: | :---: | :---: |
| $T C=5 Q$ | Q | 22.5 |
|  | P | \$27.50 |
|  | Revenue | \$618.75 |
|  | Cost | \$112.50 |
|  | Profit | \$506.25 |
| KENTSTATE | the Pobems |  |


| Profit |  |  |
| :---: | :---: | :---: |
| $\begin{gathered} \pi=\text { Revenue }- \\ \text { Cost } \end{gathered}$ | Q | 22.5 |
|  | P | \$27.50 |
|  | Revenue | \$618.75 |
|  | Cost | \$112.50 |
|  | Profit | \$506.25 |
| KENTSTATE Sowne |  |  |

Problem II

| Quantity | Price | Cost |
| :---: | :---: | :---: |
| 0 |  | 6 |
| 1 | 15 | 11 |
| 2 | 13 | 16 |
| 3 | 11 | 21 |
| 4 | 8 | 26 |
| 5 | 7 | 31 |
| 6 | 6 | 36 |
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The Answers

| Q | 3 |
| :---: | :---: |
| $P$ | 11 |
| Revenue | 33 |
| Cost | 21 |
| Profit | 12 |

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Solving the Problems

A spreadsheet approach

| $Q$ | $P$ | Revenue <br> $=P Q$ | Marginal <br> Revenue | Cost | Marginal <br> Cost | Profit |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 0 |  |  |  |  |  |  |
| 1 |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |

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Solving the Problems

| A spreadsheet approach |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Q $P$ Revenue <br> FPQ Marginal <br> Revenue Cost Marginal <br> Cost Profit <br> 0    6   <br> 1 15   11   <br> 2 13   16   <br> 3 11   21   <br> 4 8   26   <br> 5 7   31   <br> 6 6   36   <br> 7 5   41   |  |  |  |  |  |

## A spreadsheet approach

| Q | Revenue <br> $=\mathrm{PQ}$ | Marginal <br> Revenue | Cost | Marginal <br> Cost | Profit |  |
| :--- | ---: | ---: | :--- | ---: | ---: | ---: |
| 0 |  | 0 |  | 6 |  |  |
| 1 | 15 | 15 |  | 11 |  |  |
| 2 | 13 | 26 |  | 16 |  |  |
| 3 | 11 | 33 |  | 21 |  |  |
| 4 | 8 | 32 |  | 26 |  |  |
| 5 | 7 | 35 |  | 31 |  |  |
| 6 | 6 | 36 |  | 36 |  |  |
| 7 | 5 | 35 |  | 41 |  |  |

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Solving the Problems

## A spreadsheet approach

| Q | Revenue <br> =PQ | Marginal <br> Revenue | Cost | Marginal <br> Cost | Profit |  |
| :--- | ---: | ---: | ---: | ---: | :---: | :---: |
| 0 |  | 0 |  | 6 |  |  |
| 1 | 15 | 15 | 15 | 11 | 5 |  |
| 2 | 13 | 26 | 11 | 16 | 5 |  |
| 3 | 11 | 33 | 7 | 21 | 5 |  |
| 4 | 8 | 32 | -1 | 26 | 5 |  |
| 5 | 7 | 35 | 3 | 31 | 5 |  |
| 6 | 6 | 36 | 1 | 36 | 5 |  |
| 7 | 5 | 35 | -1 | 41 | 5 |  |

[^0]Solving the Problems

A spreadsheet approach

| Q | P | Revenue <br> =PQ | Marginal <br> Revenue | Cost | Marginal <br> Cost | Profit |
| :--- | ---: | ---: | ---: | ---: | :---: | :---: |
| 0 |  | 0 |  | 6 |  |  |
| 1 | 15 | 15 | 15 | 11 | 5 |  |
| 2 | 13 | 26 | 11 | 16 | 5 |  |
| 3 | 11 | 33 | 7 | 21 | 5 |  |
| 4 | 8 | 32 | -1 | 26 | 5 |  |
| 5 | 7 | 35 | 3 | 31 | 5 |  |
| 6 | 6 | 36 | 1 | 36 | 5 |  |
| 7 | 5 | 35 | -1 | 41 | 5 |  |

## A spreadsheet approach

| Q | P | Revenue <br> $=\mathrm{PQ}$ | Marginal <br> Revenue | Cost | Marginal <br> Cost | Profit |
| :--- | ---: | ---: | ---: | ---: | :---: | :---: |
| 0 |  | 0 |  | 6 |  | $\$ 6$ |
| 1 | 15 | 15 | 15 | 11 | 5 | $\$ 4$ |
| 2 | 13 | 26 | 11 | 16 | 5 | $\$ 10$ |
| 3 | 11 | 33 | 7 | 21 | 5 | $\$ 12$ |
| 4 | 8 | 32 | -1 | 26 | 5 | $\$ 6$ |
| 5 | 7 | 35 | 3 | 31 | 5 | $\$ 4$ |
| 6 | 6 | 36 | 1 | 36 | 5 | $\$ 0$ |
| 7 | 5 | 35 | -1 | 41 | 5 | $\$ 6$ |

[^1]
## End


[^0]:    KENT STATE

[^1]:    KENT STATE

