a) consumer surplus = area of \( \Delta \) that is **below** the demand curve **above** the price line

\[
\Delta = \frac{1}{2} (\$12 - \$10.50)/\text{unit} \times 6 \text{ units/week} \\
= \$4.50/\text{week}
\]

b) producer surplus = area of \( \Delta \) that is **below** the price line **above** the supply curve

\[
\Delta = \frac{1}{2} (\$10.50 - \$6)/\text{unit} \times 6 \text{ units/week} \\
= \$13.50/\text{week}
\]

c) this is the sum of gains from trading in used DVDs \\
total economic surplus generated in a week

\[
\text{total economic surplus} = \text{producer surplus} + \text{consumer surplus} \\
= \$13.50/\text{week} + \$4.50/\text{week} \\
= \$18.00/\text{week}
\]
4. Demand: \( P = 8 - Q \)

Supply: \( P = 2 + Q \)

\[
\text{total economic surplus} = \text{area of } \triangle \text{ACD}
\]

\[
= \frac{1}{2} (\# 8 - 2/\text{unit})(3,000 \text{ units/week}) \\
= \$9,000/\text{week}
\]

b) a $2 tax per unit, collected from sellers

\[\rightarrow \text{supply becomes } P = 4 + Q\]

- New economic surplus = area of \( \triangle \text{ABC} \)

\[
= \frac{1}{2} (\# 8 - 4/\text{unit})(2,000 \text{ units/week}) = \$4,000/\text{week}
\]

- Also, revenue generated from tax:

\[
(\# 2/\text{unit})(2,000 \text{ units/week}) = \$4,000/\text{week}
\]

- total economic surplus = \$4,000/week + \$4,000/week

\[\rightarrow \text{thus loss in economic surplus} = \$1,000/\text{week}\]

\[\$4,000/\text{week}\]