Comparison Properties of Definite Integrals

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**Property 6:**

If

\[ f(x) \geq 0 \quad \text{for} \quad a \leq x \leq b \]

then

\[ \int_{a}^{b} f(x) \, dx \geq 0 \]
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**Property 7:**

If

\[ f(x) \geq g(x) \quad \text{for} \quad a \leq x \leq b \]

then

\[ \int_{a}^{b} f(x) \, dx \geq \int_{a}^{b} g(x) \, dx \]
Property 8:
If
\[ m \leq f(x) \quad \text{and} \quad M \geq f(x) \quad \text{for} \quad a \leq x \leq b \]
then
\[ m(b - a) \leq \int_{a}^{b} f(x) \, dx \leq M(b - a) \]