SOME NEW IMPROVEMENTS OF YOUNG’S INEQUALITIES

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Abstract. In this paper, we obtain some improvements and generalizations of Young’s inequalities as the following:

1. If \( b \geq a \), we can get

\[
\frac{(aV_v b)^m - (a^*_v b)^m}{(aV_\tau b)^m - (a^*_\tau b)^m} \leq \frac{v(1-v)}{\tau(1-\tau)};
\]

2. If \( b \leq a \), we can get

\[
\frac{(aV_v b)^m - (a^*_v b)^m}{(aV_\tau b)^m - (a^*_\tau b)^m} \geq \frac{v(1-v)}{\tau(1-\tau)}
\]

for \( m \in \mathbb{N}_+ \) and \( 0 < v \leq \tau < 1 \). In addition, we obtain new result of Young’s inequality by using the expansions of the functions \((1-v)+vx-x^v\) with \( 0 < x < 2 \).


Keywords and phrases: Young’s inequalities, Kantorovich constant, Newton’s binomial expansion.

REFERENCES