If $x, y, z > 0$ then:

$$\frac{2x}{x^6 + y^4} + \frac{2y}{y^6 + z^4} + \frac{2z}{z^6 + x^4} \leq \frac{1}{x^4} + \frac{1}{y^4} + \frac{1}{z^4}$$

Proposed by Nguyen Hung Cuong-Vietnam

Solution by Tapas Das-India

$$\frac{2x}{x^6 + y^4} + \frac{2y}{y^6 + z^4} + \frac{2z}{z^6 + x^4} \overset{AM-GM}{\leq} \sum \frac{2x}{2x^3 y^2} = \sum \frac{1}{x^2 y^2} = \frac{x^2 + y^2 + z^2}{x^2 y^2 z^2} =$$

$$= \frac{x^2 y^2 z^2 (x^2 + y^2 + z^2)}{x^4 y^4 z^4} = \frac{\sum (x^2 y^2)(x^2 z^2)}{x^4 y^4 z^4} \overset{(\sum ab) \leq (\sum a^2) \forall\, a,b,c>0}{\leq}$$

$$\leq \frac{x^4 y^4 + y^4 z^4 + z^4 x^4}{x^4 y^4 z^4} = \frac{1}{x^4} + \frac{1}{y^4} + \frac{1}{z^4}$$

Equality holds for $x = y = z = 1$.