

Inequality 3

1. Prove that $(a + b)(b + c)(c + a) \geq 8abc$ is true for all positive numbers a, b , and c with equality only if $a = b = c$
2. Solve $\frac{x(x+2)}{x-1} \leq 0$.
3. Solve $\frac{9}{1-x} \leq \frac{7x+5}{x+3}$.
4. Solve $|2x - 3| < |x - 1| + |x - 2|$ for x .
5. (a) Find the solution of the general symmetric inequality:
 $|x + a| + |x - a| \leq b, b \geq 0$
(b) Hence find x where $|x - 1| + |x - 2| \leq 4$.
6. Solve $\left|x - \frac{1}{x}\right| < 4$.
7. Prove by mathematical induction the inequality $5^n \geq n^5$ for all $n \geq 5$.