Cambridge International AS & A Level

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Mathematics 9709/32

Paper 3 Pure Mathematics 3 **May/June 2023**

Question No (1)

1 Solve the inequality $|5x - 3| < 2|3x - 7|$.

Solution:

$|5x-3| < 2|3x-7|$

$\Rightarrow (5x-3)^2 < 2^2 (3x-7)^2$ squaring

$25x^2 - 30x + 9 < 4(9x^2 - 42x + 49)$

$25x^2 - 30x + 9 - 36x^2 + 168x - 196 < 0$

$-11x^2 + 138x - 187 < 0$

$11x^2 - 138x + 187 > 0$ ∵ if $a<0$

solving by 3 term quadratic and factorization $-1x - a > -1x0$

$a > 0$

$\left(x - \frac{17}{11}\right)(x-11) > 0$

but above inequality satisfy only for

$\left(x - \frac{17}{11}\right) < 0$, $(x-11) > 0$

$x < \frac{17}{11}$, $x > 11$

So the answer is $x < \frac{17}{11}$, $x > 11$

HERO