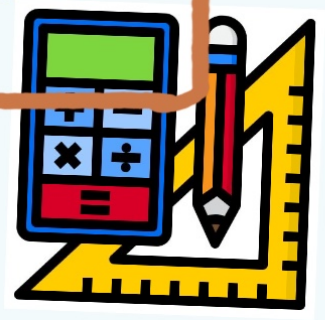
The Maths Society

LINEAR INEQUALITY



Question 1

Solve the inequality.

$3n - 11 > 5n - 18$ [2]

$-2n > -7$

$n < 7/2$

Question 2

(a) Solve the inequality.

$x + 13 \geqslant 3x + 7$ [2]

$-2x \geqslant -6$

$x \leqslant 3$

(b) List the positive integers that satisfy the inequality in **part (a)**. [1]

1, 2, 3

Question 3

Find the positive integers that satisfy the inequality $t + 2 > 3t - 6$. [3]

$-2t > -8$

$t < 4$

$\therefore$ 1, 2, 3

Question 4

Solve the inequality.

$n + 7 < 5n - 8$ [2]

$-4n < -15$

$n > \frac{15}{4}$

$n > 3\frac{3}{4}$

Question 5

Solve the inequality.

$6n + 3 > 8n$ [2]

$-2n > -3$

$n < \frac{3}{2}$

$n < 1\frac{1}{2}$

Question 6

Solve the inequality for positive integer values of x.

$\frac{21 + x}{5} > x + 1$ [4]

$21 + x > 5x + 5$

$-4x > -16$

$x < 4$

Question 7

Solve the inequality.

$5t + 23 < 17 - 2t$ [2]

$7t < -6$

$t < -\frac{6}{7}$

Question 8

Solve the inequality.

$\frac{x}{2} + \frac{x - 2}{3} < 5$ [4]

$\frac{3x + 2x - 4}{6} < 5$

$5x - 4 < 30$

$5x < 34$

$x < 6\frac{4}{5}$

Question 9

Solve the inequality.

$3x - 1 \leq 11x + 2$ [2]

$-3 \leq 8x$

$x \geq -\frac{3}{8}$

Question 1

Solve the inequality.

$\frac{2x-3}{5} - \frac{x}{3} \leqslant 2$ [3]

$\frac{6x - 9 - 5x}{15} \leq 2$

$x - 9 \leq 30$

$x \leq 39$

Question 2

x is a positive integer and $15x - 43 < 5x + 2$.

Work out the possible values of x. [3]

$10x < 45$

$x < 4.5$

$x = 1, 2, 3, 4$

Question 3

Solve the inequality.

$3y + 7 \leqslant 2 - y$ [2]

$4y \leqslant 5$

$y \leqslant 5/4$

$y \leqslant 1\frac{1}{4}$

Question 4

Solve the inequality. $2x + 5 < \frac{x-1}{4}$ [3]

$8x - 20 < x - 1$

$7x < 19$

$x < \frac{19}{7}$

$x < 2\frac{5}{7}$

Question 5

Solve the inequality $6(2 - 3x) - 4(1 - 2x) \leqslant 0.$ [3]

$12 - 18x - 4 + 8x \leqslant 0$

$-10x + 8 \leqslant 0$

$-10x \leqslant -8$

$x \geqslant \frac{4}{5}$

Question 6

Solve the inequality $\frac{2-5x}{7} < \frac{2}{5}$ [3]

$10 - 25x < 14$

$-25x < 4$

$x > 4/25$

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Question 7

Solve the inequality

$4 - 5x < 2(x + 4)$. [3]

$4 - 5x < 2x + 8$

$-7x < 4$

$x > -4/7$

Question 8

Solve the inequality [2]

$5 - 3x < 17$.

$-3x < 12$

$x > -4$

Question 9

(a) Solve the inequality $5 - \frac{2x}{3} > \frac{1}{2} + \frac{x}{4}$ [3]

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$\frac{15 - 2x}{3} > \frac{2 + x}{4}$

$60 - 8x > 6 + 3x$

$54 > 11x$

$x < \frac{54}{11}$ | $x < 4\frac{10}{11}$

(b) List the positive integers which satisfy the inequality

$5 - \frac{2x}{3} > \frac{1}{2} + \frac{x}{4}$ [1]

.

$x = 1, 2, 3, 4$

Question 1

Find the integers which satisfy the inequality.

$-5 < 2n - 1 \leq 5$ [3]

$-5 < 2n - 1$

$-4 < 2n$

$-2 < n$

$2n - 1 \leq 5$

$2n \leq 6$

$n \leq 3$

$-2 < n \leq 3$

Question 2

Solve $6x + 3 < x < 3x + 9$ for **integer** values of x. [4]

$6x + 3 < x$

$5x < -3$

$x < -\frac{3}{5} = -0.6$

$x < 3x + 9$

$-2x < 9$

$x < -4.5$

$-4.5 < x < -0.6$

$x = -4, -3, -2, -1$

Question 3

(a) Solve $3n + 23 < n + 41$. [2]

$2n < 18$

$n < 7$

$3n + 11$

-23

18

(b) Factorise completely $ab + bc + ad + cd$. [2]

$b(a+c) + d(a+c)$

$(a+c)(b+d)$

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Question 4

List all the prime numbers which satisfy this inequality.

$$16 < 2x - 5 < 48$$ [3]

$16 < 2x - 5$ $\quad$ $2x - 5 < 48$

$21 < 2x$ $\quad$ $2x < 53$

$10.5 < x$ $\quad$ $x < 26.5$

$10.5 < x < 26.5$

$x = 11, 13, 17, 19, 23$

Question 5

Solve the inequality

$$\frac{2x-5}{8} > \frac{x+4}{3}.$$ [3]

$6x - 15 > 8x + 32$

$-2x > 47$

$x < -23.5$

Question 6

Solve the inequality $3 < 2x - 5 < 7.$ [2]

$8 < 2x$ $\quad$ $2x < 12$

$4 < x$ $\quad$ $x < 6$

$4 < x < 6$