Desigualdades.

3. Desigualdades del tipo $a_1x + b_1 \geq a_2x + b_2 \geq a_3 + b_3$

Resolver las siguientes desigualdades

- (1) $3 > 3x - 1 > 1$
- (2) $5 < x + 7 < 3$
- (3) $4 > 3(x - 5) > -1$
- (4) $-1 < \dfrac{x + 1}{2} < -7$
- (5) $6 \leq 4x - 7 < -3$
- (6) $\dfrac{7}{3} < \dfrac{3x - 1}{4} \leq -\dfrac{2}{3}$
- (7) $-\dfrac{8}{3} \geq -\dfrac{2}{5}x + 1 > \dfrac{1}{2}$
- (8) $-\dfrac{1}{2} \geq \dfrac{1}{2}\left(\dfrac{x - 5}{2}\right) \geq 7$
- (9) $6 \leq -\dfrac{3}{4}\left(\dfrac{-6 + x}{2}\right) \leq 3$
- (10) $7x < 4x - 1 < 2$
- (11) $x \leq 5 \leq 5x$
- (12) $-3x \leq x + 1 \leq -x$
- (13) $3x + 1 \leq 6x - 7 \leq 5 + 2x$
- (14) $\dfrac{2}{3}x - 6 > 3 \geq \dfrac{3}{2}x - 3$
- (15) $x - 1 > \dfrac{x + 2}{3} > x + 7$
- (16) $\dfrac{3x - 2}{4} < \dfrac{3 - 2x}{5} < 7$
- (17) $\dfrac{-3x - 1}{7} > \dfrac{4x - 2}{3} > \dfrac{6x - 1}{7}$
- (18) $\dfrac{3(-x + 2)}{2} \geq \dfrac{4(-x - 2)}{5} \geq \dfrac{7}{2}x - 6$
- (19) $\dfrac{x + 9}{2}(-5) \geq 0 \geq \dfrac{3}{8}x - 7$
- (20) $\left(-\dfrac{x}{5} + 6\right)\left(-\dfrac{1}{3}\right) < x < \dfrac{5}{2}(-3 + x)$

Respuestas

3. Desigualdades del tipo $a_1x + b_1 \geq a_2x + b_2 \geq a_3 + b_3$

Resolver las siguientes desigualdades

(1) $3 > 3x - 1 > 1$

$$CS = \left(\frac{2}{3}, \frac{4}{3}\right)$$

(2) $5 < x + 7 < 3$

$$CS = \varnothing$$

(3) $4 > 3(x - 5) > -1$

$$CS = \left(\frac{14}{3}, \frac{19}{3}\right)$$

(4) $-1 < \dfrac{x+1}{2} < -7$

$$CS = \varnothing$$

(5) $6 \leq 4x - 7 < -3$

$$CS = \varnothing$$

(6) $\dfrac{7}{3} < \dfrac{3x-1}{4} \leq -\dfrac{2}{3}$

$$CS = \varnothing$$

(7) $-\dfrac{8}{3} \geq -\dfrac{2}{5}x + 1 > \dfrac{1}{2}$

$$CS = \varnothing$$

(8) $-\dfrac{1}{2} \geq \dfrac{1}{2}\left(\dfrac{x-5}{2}\right) \geq 7$

$$CS = \varnothing$$

(9) $6 \leq -\dfrac{3}{4}\left(\dfrac{-6+x}{2}\right) \leq 3$

$$CS = \varnothing$$

(10) $7x < 4x - 1 < 2$

$$CS = \left(-\infty, -\frac{1}{3}\right)$$

(11) $x \leq 5 \leq 5x$

$$CS = [1, 5]$$

(12) $-3x \le x + 1 \le -x$

$$CS = \varnothing$$

(13) $3x + 1 \le 6x - 7 \le 5 + 2x$

$$CS = \left[\frac{8}{3}, 3\right]$$

(14) $\frac{2}{3}x - 6 > 3 \ge \frac{3}{2}x - 3$

$$CS = \varnothing$$

(15) $x - 1 > \frac{x + 2}{3} > x + 7$

$$CS = \varnothing$$

(16) $\frac{3x - 2}{4} < \frac{3 - 2x}{5} < 7$

$$CS = \left(-16, \frac{22}{23}\right)$$

(17) $\frac{-3x - 1}{7} > \frac{4x - 2}{3} > \frac{6x - 1}{7}$

$$CS = \varnothing$$

(18) $\frac{3(-x + 2)}{2} \ge \frac{4(-x - 2)}{5} \ge \frac{7}{2}x - 6$

$$CS = \left[-\infty, \frac{44}{43}\right]$$

(19) $\frac{x + 9}{2}(-5) \ge 0 \ge \frac{3}{8}x - 7$

$$CS = (-\infty, -9]$$

(20) $\left(-\frac{x}{5} + 6\right)\left(-\frac{1}{3}\right) < x < \frac{5}{2}(-3 + x)$

$$CS = (5, +\infty)$$