Problems of Inequalities

1) Solve the following inequalities:

a) $5(7x + 2) \geq 2x - 7$

b) $3(6x + 8) < -x - 4$

c) $5(6x + 5) \leq -10(8x + 11)$

d) $5(x + 8) < -8(5x - 1)$

e) $7(-x - 2) - 5(2x + 4) \geq -12$

f) $10(7x - 11) \leq 6x - 2$

2) Solve the following inequalities:

a) $2 - \frac{-x - 5}{3} < \frac{1}{4} + \frac{x}{6}$

b) $\frac{9}{5} + 2x + 4 \geq \frac{2}{3} + \frac{-x + 8}{5}$

c) $2 - \frac{3(5x + 3)}{4} \geq \frac{1}{3} - \frac{-4x - 2}{3}$

d) $\frac{7}{3} - \frac{3x - 8}{2} \leq -9 + \frac{-6x + 7}{2}$

e) $\frac{18}{5} + 3x + 6 \leq 2 - \frac{-3x - 8}{2}$

f) $\frac{5}{3} + \frac{4x}{5} < -\frac{7}{3} - \frac{2(-3x + 9)}{3}$

3) Solve the following inequalities:

a) $|7x - 16| < 19$

b) $|3x - 9| < 19$

c) $|3x - 17| \geq 18$

d) $|-3x - 9| \leq 8$

e) $|2x + 2| \geq 7$

f) $|6x - 16| \leq 17$

4) Solve the following inequalities:

a) $-6x + 1 \geq 2x^2 + 1$

b) $-x^2 + 7x - 9 > 1$

c) $2x^2 + 37 > 20x + 5$

d) $x^2 + 3x \leq 0$

e) $6x + 3 > -x^2 + 3$

f) $x^2 - 5 > -1$

5) Solve the following inequalities:

a) $\frac{x + 14}{x - 4} > 7$

b) $\frac{8x}{2x - 12} < 0$

c) $\frac{8x - 4}{x + 4} \leq 2$

d) $\frac{8x - 2}{x + 4} \geq 0$

e) $\frac{x - 8}{x - 4} < 3$

f) $\frac{x}{x - 4} \geq 0$

6) Graph the solution to:

$y \leq 2x - 10$

Problems of Inequalities

Answers:

1) **a)** $x \geq \frac{-17}{33}$ **b)** $x < \frac{-28}{19}$ **c)** $x \leq \frac{-27}{22}$ **d)** $x < \frac{-32}{45}$

e) $x \leq \frac{-22}{17}$ **f)** $x \leq \frac{27}{16}$

2) **a)** $x < \frac{-41}{2}$ **b)** $x \geq \frac{-53}{33}$ **c)** $x \leq \frac{-15}{61}$ **d)** $x \leq \frac{-71}{9}$

e) $x \leq \frac{-12}{5}$ **f)** $x > \frac{25}{3}$

3) **a)** $x \in \left(\frac{-3}{7}, 5\right]$ **b)** $x \in \left(\frac{-10}{3}, \frac{28}{3}\right]$

c) $x \in \left(-\infty, \frac{-1}{3}\right] \cup \left[\frac{35}{3}, +\infty\right)$ **d)** $x \in \left[\frac{-17}{3}, \frac{-1}{3}\right]$

e) $x \in \left(-\infty, \frac{-9}{2}\right] \cup \left[\frac{5}{2}, +\infty\right)$ **f)** $x \in \left[\frac{-1}{6}, \frac{11}{2}\right]$

4) **a)** $x \in [-3, 0]$ **b)** $x \in (2, 5)$

c) $x \in (-\infty, 2) \cup (8, +\infty)$ **d)** $x \in [-3, 0]$

e) $x \in (-\infty, -6) \cup (0, +\infty)$ **f)** $x \in (-\infty, -2) \cup (2, +\infty)$

5) **a)** $x \in (4, 7]$ **b)** $x \in (0, 6]$

c) $x \in (-4, 2]$ **d)** $x \in (-\infty, -4) \cup \left[\frac{1}{4}, +\infty\right)$

e) $x \in (-\infty, 2) \cup (4, +\infty)$ **f)** $x \in (-\infty, 0] \cup (4, +\infty)$

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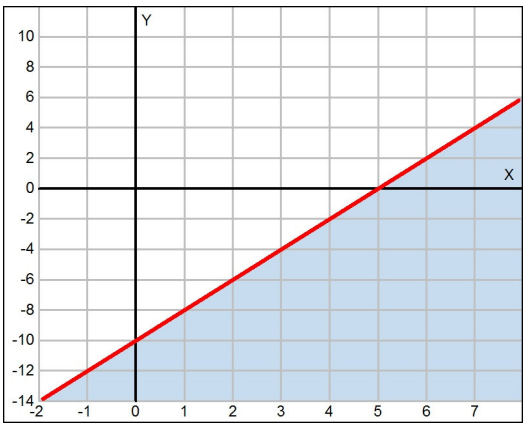
6) Graph:



Solution region: