DPP-3 (LINEAR INEQUALITY AND MODULUS INEQUALITY) (REF CODE MLJSIRLIVE)

1. Solve the following linear inequations:

(i) $3x-7>x+1$ (ii) $3x+9\geq -x+19$ (iii) $2(3-x)\geq \frac{x}{5}+4$

(iv) $-(x-3)+4<5-2x$ (v) $\frac{5-2x}{3}<\frac{x}{6}-5$

2. Solve the following linear inequations:

(i) $\frac{1}{2}\left(\frac{3}{5}x+4\right)\geq \frac{1}{3}(x-6)$ (ii) $\frac{2x-3}{4}+9\geq 3+\frac{4x}{3}$

(iii) $\frac{3}{x-2}<1$ (iv) $\frac{5x+8}{4-x}<2$

(v) $\frac{x-3}{x-5}>0$

3. Solve the following linear inequations:

(i) $2x-3<7,\ 2x>-4$ (ii) $5x-1<24,\ 5x+1>-24$

(iii) $11-5x>-4,\ 4x+13\leq -11$ (iv) $2(x-6)<3x-7,\ 11-2x<6-x$

(v) $-5<2x-3<5$

4. Solve the following system of inequations:

$\frac{5x}{4}+\frac{3x}{8}>\frac{39}{8}$ and $\frac{2x-1}{12}-\frac{x-1}{3}<\frac{3x+1}{4}$

5. Solve: (i) $-5\leq \frac{2-3x}{4}\leq 9$ (ii) $10\leq -5(x-2)<20$

6. Solve: (i) $|x+2|\geq 5$ (ii) $|4-x|+1<3$ (iii) $\left|x+\frac{1}{3}\right|>\frac{8}{3}$

(iv) $\left|\frac{3x-4}{2}\right|\leq \frac{5}{12}$ (v) $\left|\frac{2}{x-4}\right|>1,\ x\neq 4$

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7. Solve the following system of equations:

(i) $\frac{2x+1}{7x-1} > 5, \frac{x+7}{x-8} > 2$

(ii) $\frac{x}{2x+1} \geq \frac{1}{4}, \frac{6x}{4x-1} < \frac{1}{2}$

8. Solve: (i) $\frac{|x|-1}{|x|-2} \geq 0,\ x \in R, x \neq \pm 2$ (ii) $\frac{1}{|x|-3} < \frac{1}{2}$

9. Solve: (i) $\left|\frac{2x-1}{x-1}\right| > 2$

(ii) $\frac{|x-2|}{x-2} > 0$

10. Solve $\frac{|x+2|-x}{x} < 2$

11. Solve: $|x-1|+|x-2|+|x-3| \geq 6$

12. Solve: $\frac{|x+3|+x}{x+2} > 1$

13. *IQ* of a person is given by the formula $IQ = \frac{MA}{CA} \times 100$, where *MA* is mental age and *CA* is chronological age. If $80 \leq IQ \leq 140$ for a group of 12 year children, find the range of their mental age.

Answers

1. (i) $(4, \infty)$ (ii) $\left[\frac{5}{2}, \infty\right)$ (iii) $\left(-\infty, \frac{10}{11}\right]$ (iv) $(-\infty, -2)$ (v) $(8, \infty)$

2. (i) $x \in (-\infty, 120]$ (ii) $x \in \left(-\infty, \frac{63}{10}\right]$ (iii) $(-\infty, 2) \cup (5, \infty)$

(iv) $(-\infty, 0) \cup (4, \infty)$ (v) $x \in (-\infty, 3) \cup (5, \infty)$

3. (i) $(-2, 5)$ (ii) $(-5, 5)$ (iii) $(-\infty, -6]$ (iv) $(5, \infty)$ (vi) $(-1, 4)$

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4. $x \in (3, \infty)$

5. (i) $x \in \left[\frac{-34}{3}, \frac{22}{3}\right]$ (ii) $(-2, 0]$

6. (i) $x \in (-\infty, -7] \cup [3, \infty)$ (ii) $(2, 6)$

(iii) $(-\infty, -3) \cup \left(\frac{7}{3} \infty\right)$ (iv) $\left[\frac{19}{18}, \frac{29}{18}\right]$ (v) $(2, 4) \cup (4, 6)$

7. (i) no solution (ii) no solution

8. (i) $[-1, 1] \cup (-\infty, -2) \cup (2, \infty)$ (ii) $(-\infty, -5) \cup (-3, 3) \cup (5, \infty)$

9. (i) $\left(\frac{3}{4}, 1\right) \cup (1, \infty)$ (ii) $(2, \infty)$ **10.** (i) $(-\infty, 0) \cup (1, \infty)$

11. $(-\infty, 0] \cup [4, \infty)$ **12.** $x \in (-5, -2) \cup (-1, \infty)$

13. $9.6 \le MA \le 16.8$