Problems for Gateway #1: Inequalities

1. The numerical values denoted by the inequality $-1 < x < 4$ consist of:

(a) all values of x between $x = -1$ and $x = 4$, including $x = -1$ but not $x = 4$

(b) all values of x between $x = -1$ and $x = 4$, including $x = 4$ but not $x = -1$

(c) all values of x between $x = -1$ and $x = 4$, including neither $x = -1$ nor $x = 4$

(d) all values of x between $x = -1$ and $x = 4$, including both $x = -1$ and $x = 4$

(e) all values of x that are less than $x = -1$ and all values of x that are greater than $x = 4$

2. The numerical values denoted by the inequality $2 \le x < 5$ consist of:

(a) all values of x that are less than or equal to $x = 2$ and all values of x that are greater than 5, but not including $x = 5$

(b) all values of x between $x = 2$ and $x = 5$, including both $x = 2$ and $x = 5$

(c) all values of x between $x = 2$ and $x = 5$, including neither $x = 2$ nor $x = 5$

(d) all values of x between $x = 2$ and $x = 5$, including $x = 2$ but not $x = 5$

(e) all values of x between $x = 2$ and $x = 5$, including $x = 5$ but not $x = 2$

3. The numerical values denoted by the inequality $1 < x \le 2$ consist of:

(a) all values of x between $x = 1$ and $x = 2$, including $x = 1$ but not $x = 2$

(b) all values of x between $x = 1$ and $x = 2$, including $x = 2$ but not $x = 1$

(c) all values of x between $x = 1$ and $x = 2$, including neither $x = 1$ nor $x = 2$

(d) all values of x between $x = 1$ and $x = 2$, including both $x = 1$ and $x = 2$

(e) all values of x that are less than $x = 1$ as well as all values of x that are greater than $x = 2$, including $x = 2$.

4. The values of x that satisfy the inequality $1 + x > 2$ are:

(a) all values of x between $x = 1$ and $x = 2$, not including either $x = 1$ or $x = 2$

(b) all values of x greater than $x = 1$, including $x = 1$

(c) all values of x less than $x = 1$, not including $x = 1$

(d) all values of x less than $x = 1$, including $x = 1$

(e) all values of x greater than $x = 1$, not including $x = 1$

5. The values of x that satisfy the inequality $2x < 3 + x$ are:

(a) all values of x less than $x = 3$, not including $x = 3$

(b) all values of x between $x = 2$ and $x = 3$, not including $x = 2$ or $x = 3$

(c) all values of x between $x = 2$ and $x = 3$, including $x = 2$ but not $x = 3$

(d) all values of x between $x = 2$ and $x = 3$, including $x = 3$ but not $x = 2$

(e) all values of x greater than $x = 2$, not including $x = 2$

6. The values of x that satisfy the inequality $x > 4 - x$ are:

(a) all values of x greater than $x = 2$, not including $x = 2$

(b) all values of x between $x = 1$ and $x = 4$, not including either $x = 1$ or $x = 4$

(c) all values of x between $x = 1$ and $x = 4$, including both $x = 1$ and $x = 4$

(d) all values of x between $x = 1$ and $x = 4$, including $x = 1$ but not $x = 4$

(e) all values of x between $x = 1$ and $x = 4$, including $x = 4$ but not $x = 1$

7. The values of x that satisfy the inequality $2x < 16 + x$ are:

(a) all values of x greater than $x = 8$ but less than $x = 16$, not including either $x = 8$ or $x = 16$

(b) all values of x less than $x = 16$, not including $x = 16$

(c) all values of x less than $x = 8$, not including $x = 8$

(d) all values of x less than $x = 16$, including $x = 16$

(e) all values of x less than $x = 8$, including $x = 8$

8. The values of x that satisfy the inequality $x^2 < 1$ are:

(a) all values of x less than 1, not including $x = 1$

(b) all values of x between $x = -1$ and $x = 1$, not including $x = -1$ or $x = 1$

(c) all values of x less than $x = -1$, not including $x = -1$

(d) all values of x less than $x = -1$ and greater than $x = 1$, not including wither $x = -1$ or $x = 1$

(e) all possible values of x.

9. The values of x that satisfy the inequality $x^2 > 9$ are:

(a) all values of x greater than $x = -3$, not including $x = -3$

(b) all values of x greater than $x = 3$, not including $x = 3$

(c) all values of x less than $x = -3$ and all values of x greater than $x = 3$, not including either $x = -3$ or $x = 3$

(d) all values of of x between $x = -3$ and $x = 3$, not including either $x = -3$ or $x = 3$

(e) all values of x less that $x = 3$, not including $x = 3$

10. The values of x that satisfy the inequality $x^2 < 4$ are:

(a) all values of x less than $x = 2$, not including $x = 2$

(b) all values of x greater than $x = 2$, not including $x = 2$

(c) all values of x greater than $x = -2$, not including $x = -2$

(d) all values of x between $x = -2$ and $x = 2$, not including either $x = -2$ or $x = 2$

(e) all values of x less than $x = -2$, not including $x = -2$

11. The values of x that satisfy the inequality $x^2 > 0$ are:

(a) all values of x greater than $x = 0$, not including $x = 0$

(b) all values of x less than $x = 0$, not including $x = 0$

(c) all values of x that are both less than and greater than $x = 0$

(d) $x = 0$ only

(e) all values of x except for $x = 0$

12. The values of x that satisfy the inequality $\frac{1}{x^2} < 100$ are:

(a) all values of x greater than $x = 10$, not including $x = 10$

(b) all values of x less that $x = -10$, not including $x = -10$

(c) all values of x between $x = -10$ and $x = 10$, not including $x = -10$ or $x = 10$

(d) all values of x greater than $x = 10$, not including $x = 10$, and all values of x less than -10, not including $x = -10$

(e) all values of x between $x = -10$ and $x = 10$ including both $x = -10$ and $x = 10$

13. The values of x that satisfy the inequality $\frac{1}{x} > 3$ are:

(a) all values of x greater than $x = 0$ and less than $x = 3$.

(b) all values of x between $x = -1/3$ and $x = 1/3$.

(c) all values of x greater than $x = 0$ and less than $x = 1/3$.

(d) all values of x greater than $x = 1/3$.

(e) There are no values of x that satisfy this inequality.

14. The values of x that satisfy the inequality $4 < \frac{1}{x}$ are:

(a) all values of x greater than $x = 4$.

(b) all values of x between $x = 0$ and $x = 0.25$.

(c) all values of x between $x = -0.25$ and $x = 0.25$.

(d) all values of x less than $x = -4$ and all values of x greater than $x = 4$.

(e) There are no values of x that satisfy this inequality.

15. The values of x that satisfy the inequality $\frac{1}{x+1} < \frac{1}{2}$ are:

(a) all values of x greater than $x = 1$.

(b) all values of x greater than $x = 0.5$.

(c) all values of x between $x = -1$ and $x = 1$.

(d) all values of x less than $x = -1$ and all values of x greater than $x = 1$.

(e) There are no values of x that satisfy this inequality.

Answers:

1.	C	**2.**	D	**3.**	B	**4.**	E	**5.**	A	**6.**	A
7.	B	**8.**	B	**9.**	C	**10.**	D	**11.**	E	**12.**	D
13.	C	**14.**	B	**15.**	A						