Sec 2.3 – Solving Algebraic Inequalities

Find the values for the variable that makes the statement true. (SHOW WORK NEATLY)

1. \(3x > 6\)
2. \(20 \geq 4m\)
3. \(-3x < 12\)
4. \(3b + 2 \leq 20\)
5. \(8a - 12 > 2a\)
6. \(2p - 6 + 2p + 1 \leq 11 + 8p\)
7. \(8 \geq 3(m - 4) - 5m\)
8. \(3x + \frac{3}{4} - \frac{1}{2}x > \frac{5}{2}\)

I. Eliminate parenthesis by distributing.

\[
2(3x - 4) > 5
\]

Example:

\[
6x - 8 > 5
\]

II. Eliminate fractions by multiplying each term by the lowest common denominator.

\[
\frac{1}{3}x - \frac{1}{2} \leq \frac{x}{4}
\]

Example:

\[
\frac{12}{1}x - \frac{12}{1}x \leq \frac{12x}{1}
\]

\[
4x - 6 \leq 3x
\]

III. Combine like terms on each side of the equation.

\[
4x + 2 - 7x > 2 + x + 8
\]

Example:

\[
-3x + 2 > 10 + x
\]

IV. Move the "variable" term to one side of the equation and the constants to the other side using addition or subtraction.

\[
\frac{3x + 2 \geq 6x - 5}{-3x}
\]

Example:

\[
\frac{2 \geq 3x - 5}{+5}
\]

\[
7 \geq 3x
\]

V. Divide both sides by the coefficient (the number in front of the variable).

\[
\frac{-4x > 12}{-4}
\]

Example:

\[
\frac{-4x > 12}{-4}
\]

\[
x < 3
\]
Find the values for the variable that makes the statement true. (SHOW WORK NEATLY)

9. \(2^x > 32\)
10. \(5^x \leq 125\)

Write an inequality statement for each graph using \(x\).

11. \(-10\)
12. 

Solve the following inequalities for the requested variable.

13. \(4x - 2y \geq 6 - 2x\) (solved for \(y\))
14. \(3(a - b) + 5b < 8b - 12\) (solved for \(a\))