

College Algebra Day 5

Section 2.4 Linear Inequalities

Form:

Linear Inequalities and Functions:

The meaning of $f(x) \geq 0$ $f(x) \leq 0$ with respect to the graph of f .

Properties of Inequalities

Interval Notation

Example: Express the following using interval notation.

(a) $x \geq -3$ (b) $2 > x$ (c) $x < -4$ or $x \geq 1$ (d) $\{x \mid 5 \leq x \leq 12\}$

Solving Linear Inequalities Symbolically

Example: Solve the following inequalities, expressing your answer in set-builder and interval notation.

(a) $2x + 1 < \frac{2-x}{-4}$

(b) $-2(2-3x) \geq 8-2(x-2)$

Graphical Solutions:

Example: Solve the linear inequality by graphing

$$1.238x + 0.998 \leq 1.23(3.987 - 2.1x)$$

Intersection of Graphs

x-intercept method

Compound Inequalities

Example: Solve $\frac{3}{4} \leq \frac{3-t}{2} < 1$. Write the solution in interval notation

Applications:

Example: The number of species of fish in the Thames River in England from 1967 to 1978 can be modeled by the function $f(x) = 6.15x - 12,059$, where x is the year

- (a) Estimate the year when the number of species first exceeded 70.
- (b) Estimate the years when the number of species was between 50 and 100.