St. Anthony's Canossian Secondary School
Secondary 3 Mathematics

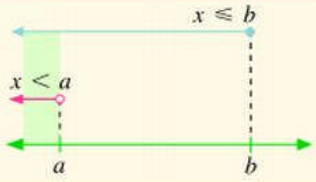
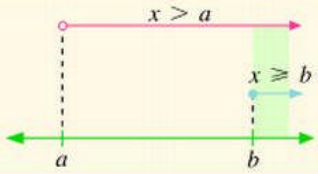
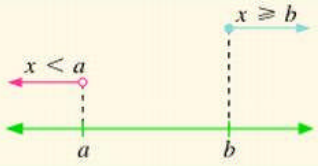
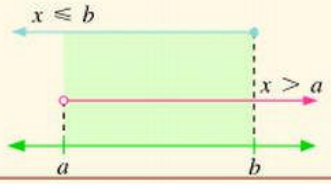
Semester 1 Tutorial 4: Inequalities

Name: _____ ( ) Date: _____
Class: _____

Summary

Simultaneous Linear Inequalities

Suppose $a < b$.

Inequalities	Solution	Solution on a number line
1. $x < a$ and $x \leqslant b$	$x < a$	
2. $x > a$ and $x \geqslant b$	$x \geqslant b$	
3. $x < a$ and $x \geqslant b$	no solution	
4. $x > a$ and $x \leqslant b$	$a < x \leqslant b$	

Basic Questions

1) Solve the following inequality $x - 7 \le 5 - 2x$.

2) Solve the inequality $\frac{7x-1}{2} \le 2x + 3$.

3) Solve the inequality $3x > \frac{x}{2} + 20$.

4) Find the smallest prime number y for which $3(y - 4) > 24$.

5) (a) Solve the inequality $-7 \le 2x - 5 < 9$. Show your solution on the number line in the answer space.
(b) Write down the integer values of x which satisfy the inequality.

6) Given that $\frac{9}{a+1} < 4, a \ge 0$.

(a) Solve this inequality.
(b) If a is an integer, what is the least value of a?

Average Questions

7) (a) Solve $-5 \le 2x + 3 \le 10$,

(b) Hence, write down the greatest and least integer values of x which satisfy $-5 \le 2x + 3 \le 10$.

8) Solve the inequalities $3(x - 3) < 4x - \frac{1}{2} < 2(8 - x)$.

9) Find the greatest integer value of x that satisfies the inequality $\frac{3-2x}{3} < \frac{3x+1}{7} < 5 - x$.

10) (a) Solve the inequality $3 - 2x \le \frac{1}{3}(x - 2) < \frac{1}{4}(x + 3)$.
(b) Write down the greatest prime number which satisfies the inequality.

11) Solve $\frac{8x+9}{2} \le 3(x+1) < 2(3x+6)$, illustrating your answer using the number line. Hence, list the integer values of x.

12) Find the integer values of x for which $1-x < 3x+5 \le \frac{4x+15}{2}$.

13) (a) Solve the following inequality, $-1 < \frac{x-3}{3} \le \frac{4}{5}$.

(b) Hence, state the largest rational number x.

Challenging Questions

14) Mrs. Lim buys x apples at \$0.40 each and $(x-5)$ oranges at \$0.50 each. She wishes to spend less than \$10.

(a) Form an inequality in x.

(b) Solve the inequality and hence, find the largest possible integer value of x.

15) Mr Goh bought 188 oranges for \$35.40. He sold each orange at 35 cents each. By forming an inequality, find the minimum number of oranges that Mr Goh must sell in order to make a profit of not less than \$8.

[Answer Key]

1)	$x \le 4$	2)	$x \le \frac{7}{3}$
3)	$x > 8$	4)	13
5)	(a) $-1 \le x < 7$ (b) –1, 0, 1, 2, 3, 4, 5, 6	6)	(a) $a > 1\frac{1}{4}$ (b) 2
7)	(a) $-4 \le x \le 3.5$ (b) 3 , −4	8)	$-8.5 < x < 2.75$
9)	$x = 3$	10)	(a) $\frac{11}{7} \le x < 17$ (b) 13
11)	$-3 < x \le -1.5, x = -2$	12)	0, 1 and 2
13)	(a) $0 < x \le 5\frac{2}{5}$ (b) $5\frac{2}{5}$	14)	(a) $40x + 50(x-5) < 1000$ (b) $x = 13$
15)	124		

☺ *Instead of giving myself reasons why I can't, I give myself reasons why I can.* ☺