Calculus - 1

Properties of Real Numbers and Bounds : lecture 2

Exp :- Find the solution set of the following:

(a) $3x-2 \geq 0$ and $5x-1 < 0$

(b) $-0.03 \leq \frac{2x+3}{5} \leq 0.03$

(c) $3+x \leq 5x-2 < 7+x$

(a) $3x-2 \geq 0$ and $5x-1<0$

$3x \geq 2$ and $5x < 1$

$x \geq 2/3$ $\qquad x < 1/5$

$x \geq 0.66\ldots$ $\quad$ $x < .2$

$0.66 \leq x < 0.2$

which is not possible

Hence set is ϕ

(b) $-0.03 \leq \frac{2x+3}{5} \leq 0.03$

$-0.03 \times 5 \leq 2x+3 \leq 0.03 \times 5$

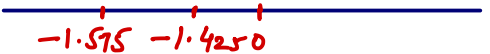
$-0.15 \leq 2x+3 \leq 0.15$

$$-0.15 - 3 \leq 2x \leq 0.15 - 3$$

$$-3.15 \leq 2x \leq -2.85$$

$$\frac{-3.15}{2} \leq x \leq \frac{-2.85}{2}$$

$$-1.575 \leq x \leq -1.425$$



Solution set is

$$[-1.575, -1.425]$$

(c) $3+x \leq 5x-2 < 7+x$

Subtract x

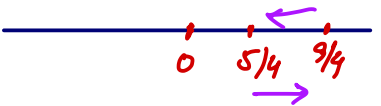
$3 \leq 4x-2 < 7.$

$5 \leq 4x < 9$

$\frac{5}{4} \leq x < \frac{9}{4}$

Solution set

$[5/4, 9/4)$



$2x-3 < 5x+3 < 2x+3.$