TYPE 1: INEQUALITY WITH MODULUS ON BOTH SIDES.

SQUARE BOTH SIDES AND MODULUS DISAPPEARS.

5 Solve the inequality $|x-2| > 3|2x+1|$. [4]

 9709/03/M/J/08

$$(|x-2|)^2 > (3|2x+1|)^2$$

$$(x-2)^2 > 9(2x+1)^2$$

$$x^2 - 4x + 4 > 9(4x^2 + 4x + 1)$$

$$x^2 - 4x + 4 > 36x^2 + 36x + 9$$

$$0 > 35x^2 + 40x + 5$$

$$0 > 5(7x^2 + 8x + 1)$$

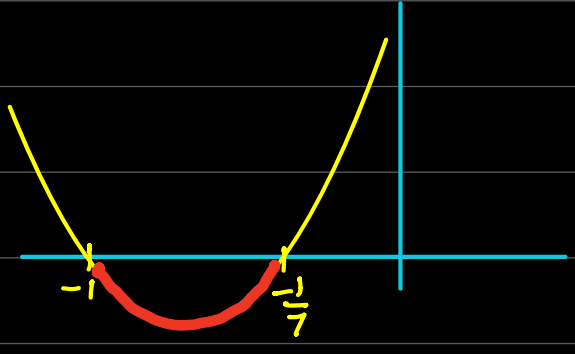
$$7x^2 + 8x + 1 < 0$$

$$7x^2 + 7x + x + 1 < 0$$

$$7x(x+1) + 1(x+1) < 0$$

$$(7x+1)(x+1) < 0$$

Root: $x = -\frac{1}{7}$, $x = -1$



$$-1 < x < -\frac{1}{7}$$

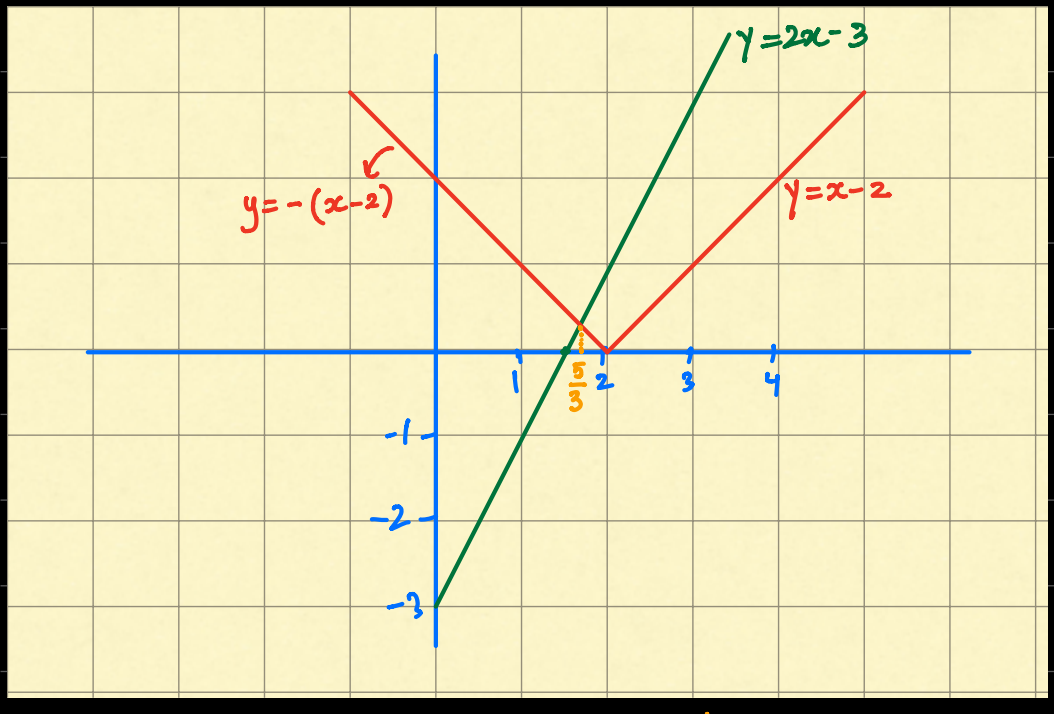
TYPE 2 : One side has modulus, one doesn't.

USE GRAPHICAL APPROACH.

14 Solve the inequality $|x - 2| > 2x - 3$. [4]

$|x-2| > 2x-3$

$y = |x-2| > y = 2x-3$



$y = 2x - 3$

y-int, $x = 0, y = -3$

x-int, $y = 0, 1.5$

$y = x - 2$

$y = -(x-2)$ and $y = 2x-3$

$-(x-2) = 2x-3$

$-x + 2 = 2x - 3$

$5 = 3x$

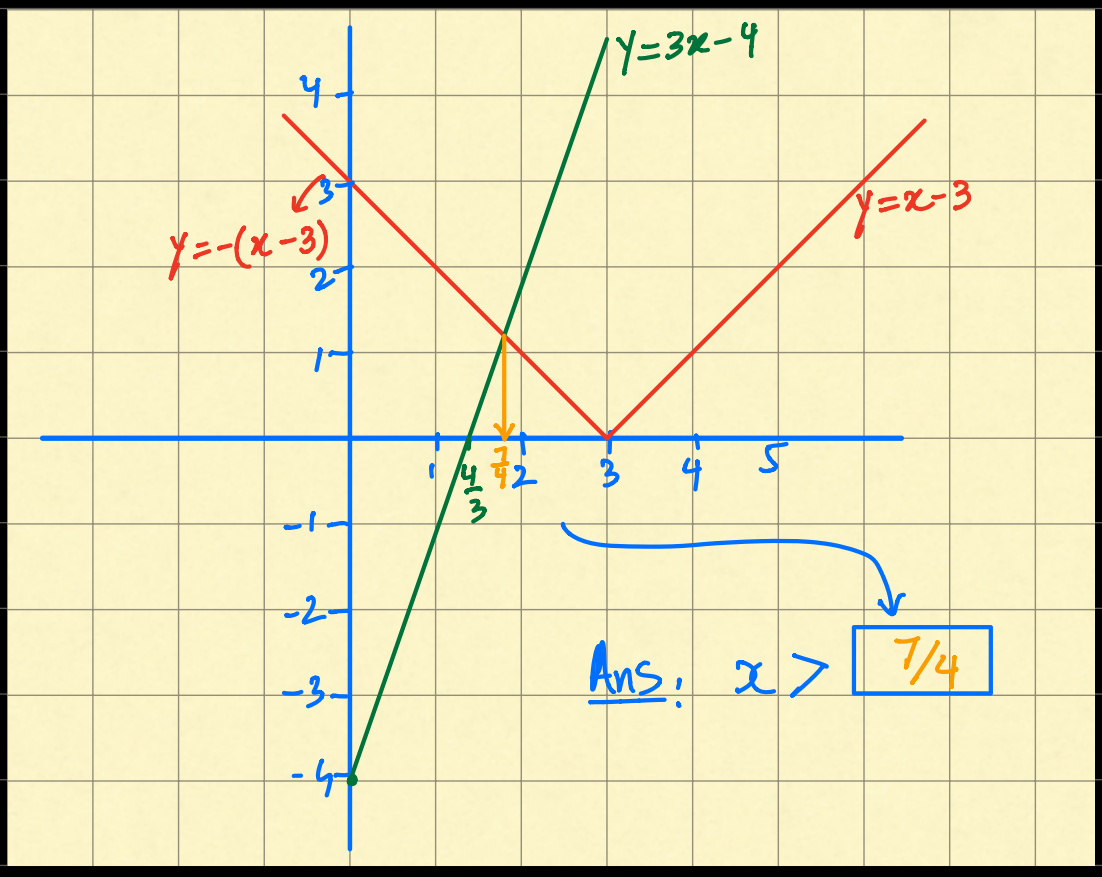
$x = 1.667$

$|x-2| > 2x-3$

Ans: $x < \frac{5}{3}$

18 Solve the inequality $|x - 3| < 3x - 4$. [4]

$y = |x-3| < y = 3x-4$



$y = 3x - 4$

$y = x - 3$

Ans: $x > 7/4$

$y = -(x-3)$ $\quad y = 3x - 4$

$-x + 3 = 3x - 4$

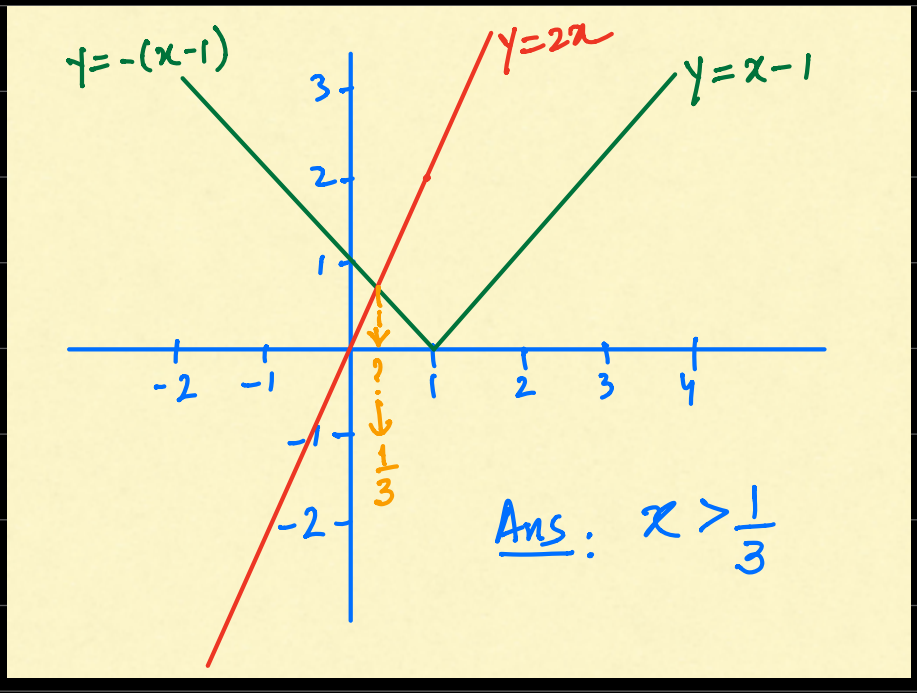
$7 = 4x$

$x = \frac{7}{4}$

3 Solve the inequality $2x > |x - 1|$. [4]

$2x > |x-1|$

$y = 2x > y = |x-1|$



$y = -(x-1)$, $y = 2x$

$-x+1 = 2x$

$1 = 3x$

$x = \frac{1}{3}$