§2.5 Compound Inequalities

(Lect. Notes p. 32)

Compound Inequalities (Definitions)

- Two inequalities joined by the words "and" or "or" are called compound inequalities. For example,

$x+3<8$ and $x>2$ (compound inequality)

$\frac{2x}{3} \geq 5$ or $-x+10<7$ (compound inequality)

Solve Compound Inequalities Containing the Word "and"

See lecture notes

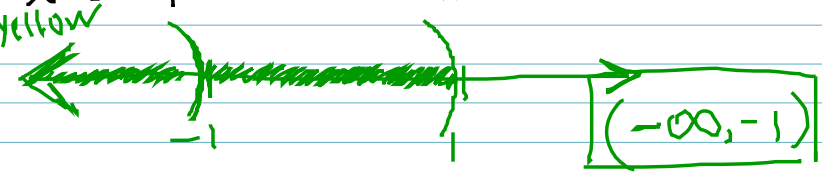
"and" has 3 letters, so we use 3 colors:

pencil, blue highlighter, yellow highlighter

(16) (18) (34) Solve the compound inequality. Express your answer in interval notation.

(16) $x<-1$ and $x<1$

yellow



$(-\infty,-1)$

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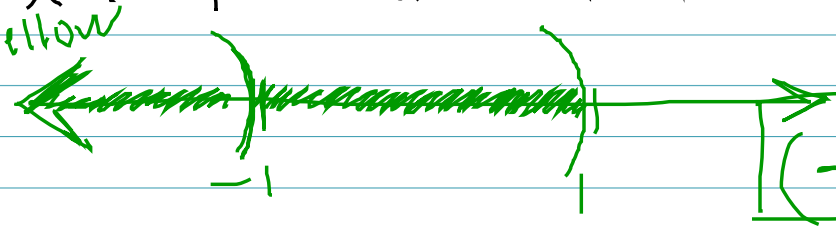
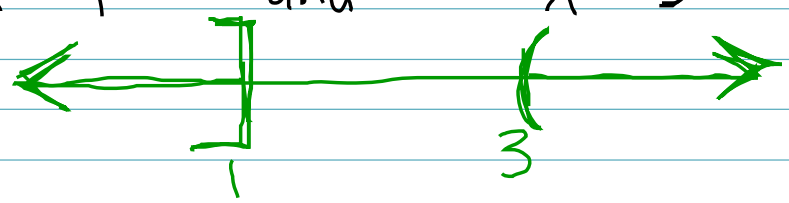


$\boxed{(-\infty,-1)}$

(15) $x \le 1$ and $x > 3$



No overlap

No green

$\boxed{\text{No Solution}}$

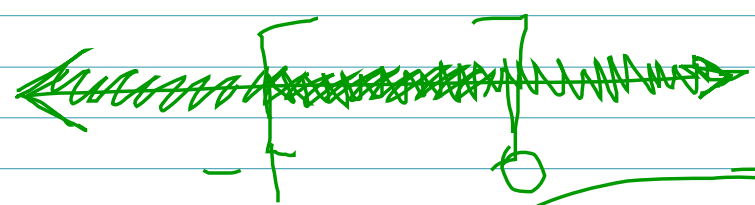
(34) $-x - 8 \ge -8$ and $x + 9 \ge 8$

$+8 \quad +8$ $\qquad$ $-9 \quad -9$

$-x \ge 0$ $\qquad$ $x \ge -1$

$\frac{-1x}{-1} \ge \frac{0}{-1}$

$x \le 0$ and $x \ge -1$



$[-1, 0]$

(54) Thomas needs to earn a "C" in his algebra class. His current test scores are 71, 69, 80, and 72. His final exam is worth 2 test scores. In order to earn a "C," Thomas's average must lie between 70 and 79 inclusive. What range of scores can Thomas receive on the final to earn a C in the course?

F := the final exam score

$$\text{Average} = \frac{71+69+80+72+F+F}{6}$$

$$\text{Average} = \frac{292+2F}{6}$$

$$70 \le \text{Avg} \le 79$$

Same direction!

$$(6)(70) \le (6)\left(\frac{292+2F}{6}\right) \le (79)(6)$$

Goal: If your inequality or equality contains fractions, clear them first. LCD = 6

$$420 \le 292+2F \le 474$$
$$-292 \quad -292 \quad -292$$

$$\frac{128}{2} \le \frac{2F}{2} \le \frac{182}{2}$$

$$64 \le F \le 91$$

[64, 91]

Solve Compound Inequalities Containing the Word "or" (Lect. Notes p. 34)

See lecture notes.

"or" has two letters, so we use 2 colors:

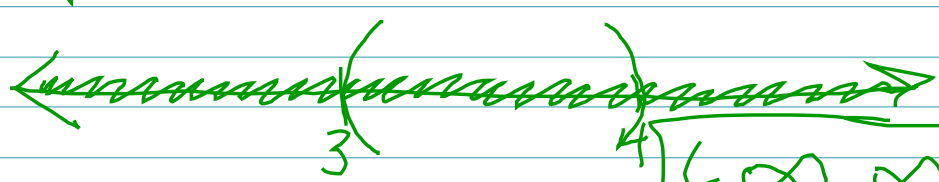
pencil and green highlighter

(24) (26) (29) Solve the compound inequality. Express your answer in interval notation.

(24) $x < 7$ or $x < 8$

$\boxed{(-\infty, 8)}$

(26) $x > 3$ or $x < 4$



$\boxed{(-\infty, \infty)}$

All real numbers

(29) $-2(x-3) > -4$ or $x+8 > 11$

$-2x+6 > -4$

$\quad -6 \quad -6$

$\frac{-2x}{-2} > \frac{-10}{-2}$

$x < 5$

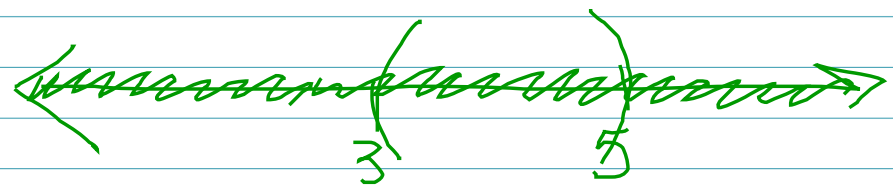
$x+8 > 11$

$-8 \quad -8$

$x > 3$

or

$x > 3$



$(-\infty, \infty)$

How to Study for my tests

Web site

Course Materials

Int Alg: Progress Test 1 Review and Study Sheet