

Inequalities Review Sheet

Solve and graph each inequality.

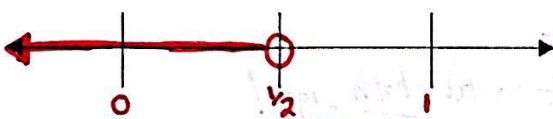
whatever 44.5 is, that's what the numerator must equal!

1) $\frac{1}{3}b + \frac{1.3}{4.3} < \frac{5}{12}$

$\frac{1}{3}b + \frac{3}{12} < \frac{5}{12}$
 $-\frac{3}{12} -\frac{3}{12}$

$\frac{1}{3}b < \frac{2}{12}$

$3 \cdot \frac{1}{3}b < \frac{1}{6} \cdot 3 \rightarrow b < \frac{1}{2}$



2) $\frac{-2(10x+20)}{5} > 44.5$

$\frac{-2(10x+20)}{-2} > \frac{220}{-2}$

$10x+20 < -110$

$\frac{10x}{10} < \frac{-130}{10} \rightarrow x < -13$

OR $-2(10x+20) > 220$
 $-20x-40 > 220$
 $+40 +40$
 $\frac{-20x}{-20} > \frac{260}{-20}$
 $x < -13$



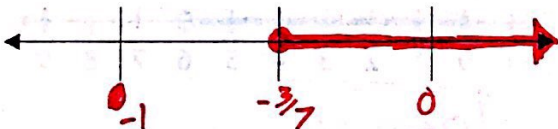
3) $6x - 2(x+2) \geq 2 - 3(x+3)$

$6x - 2x - 4 \geq 2 - 3x - 9$

$\frac{4x-4}{+3x+4} \geq \frac{-3x-7}{+3x+4}$

$\frac{7x}{7} \geq \frac{-3}{7}$

$x \geq -\frac{3}{7}$



4) $2(x+1) > 3x - 6 - x$

$2x+2 > 2x-6$ ← will always work!
 $\frac{2x}{2x} \quad \frac{-2x}{-2x}$

$2 > -6$ ← true statement

Infinite Solutions or All real numbers



Carter and Cooper are considering opportunities for summer work. The table shows the jobs open to them and the pay for each. Use this information to answer the following:

5) Carter has saved \$91 from last year and would like to baby-sit to earn enough to buy a mountain bike. A good quality bike costs at least \$300. What numbers of hours h can Carter baby-sit to reach his goal?

$91 + 5.50h \geq 300$
 $-\frac{91}{-91}$
 $\frac{5.50h}{5.50} \geq \frac{209}{5.50}$

$h \geq 38$

At least 38 hours

Job	Pay
Mowing Lawns	\$15 per lawn
Baby-Sitting	\$5.50 per hour
Tutoring	\$9 per session

6) Cooper has agreed to tutor for the school. He owes his older brother \$59 and would like to end the summer with at least \$400 in savings. How many sessions s can Cooper tutor to meet his goal?

$-59 + 9s \geq 400$
 $+\frac{59}{+59}$
 $\frac{9s}{9} \geq \frac{459}{9}$

$s \geq 51$

At least 51 sessions

$\frac{51}{9 \overline{)459}}$
 $\underline{45}$
 09
 $\underline{09}$
 0

7) When do you "switch the inequality" ?

Switch the inequality sign when you multiply or divide both sides by a negative number.

8) Graph $-4 < x$

↓
Same as $x > -4$



9) Which of the following is the solution for the inequality shown below?

$$\frac{-5 < 1 - 3x < 10}{-1 \quad -1 \quad -1}$$

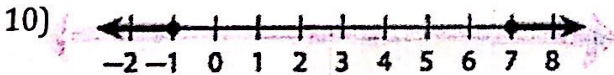
- A. $-5 < x < 10$
- B. $-3 < x$
- C. $-3 < x < 2$
- D. $-2 < x < 3$
- E. $x < -3$ or $x > 2$

$$\frac{-6 < -3x < 9}{-3 \quad -3 \quad -3} \leftarrow \text{switch both signs!}$$

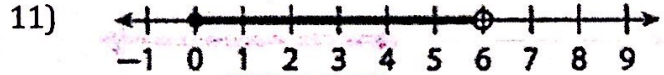
$$2 > x > -3$$

same as C

For 10-11, give the compound inequality that each graph describes.



$$x \leq -1 \text{ OR } x \geq 7$$



$$0 \leq x < 6$$

or
 $x \geq 0 \text{ AND } x < 6$

12) The Daily Info charges a fee of \$650 plus \$80 per week to run an ad. The People's Paper charges \$145 per week. For how many weeks must an ad run for the total cost at the Daily Info to be less expensive than the cost at the People's Paper? Let w be the number of weeks the ad runs in the paper.

DI ← must be less

$$\begin{array}{r} 650 + 80w \\ -80w \end{array} < \begin{array}{r} 145w \\ -80w \end{array}$$

$$\frac{650}{65} < \frac{65w}{65}$$

$$10 < w \rightarrow (\text{or } w > 10)$$

More than 10 weeks
(so 11 weeks or greater)

↑ b/c there are no decimal weeks