

3.6/3.7 Notes

Wednesday, September 16, 2015
8:49 AM

Integrated Honors
3.6/3.7 Notes (Inequalities)

Solving inequalities Divide or multiply by negative must flip the sign.

inequality, also do interval notation: infinities always get ()
 $(a, b]$ a is lowest value but not included ()
 b is highest value & it is included]

Example 1: Solve and graph.

1. $5 - 4x^3 \geq 1$

$$\begin{aligned} -5 & \quad -5 \\ -4x^3 & \geq -4 \\ \frac{-4x^3}{-4} & \geq \frac{-4}{-4} \\ x^3 & \leq 1 \\ \sqrt[3]{x^3} & \leq \sqrt[3]{1} \\ x & \leq 1 \end{aligned}$$

2. $6x < 1 - 4(3 - 2x)$

$$\begin{aligned} 6x & < 1 - 4(3 - 2x) \\ 6x & < 1 - 12 + 8x \\ 6x & < -11 + 8x \\ -8x & \quad -8x \\ -2x & < -11 \\ x & > \frac{11}{2} \end{aligned}$$

$(\frac{11}{2}, \infty)$

COMPOUND INEQUALITIES:

$-3 < x \leq 5$

$x > -3$ and $x \leq 5$
 $(-3, 5]$

$(-\infty, 1]$
 ↑ lowest ↑ highest

Example 2: Write an inequality for each statement.

a.) t is less than 4 and greater than 0 $0 < t < 4$ $(0, 4)$

b.) p is greater than 1 and no more than 5 $1 < p \leq 5$ $(1, 5]$

c.) q is less than -2 or greater than 1 $q < -2$ or $q > 1$

d.) b is between 0 and 6 inclusive $0 \leq b \leq 6$ $[0, 6]$

$(-\infty, -2) \cup (1, \infty)$

Example 3: Graph each compound inequality.

a.) $-4 \leq x < 1$

b.) $x \leq 1$ or $x \geq 2$

$(-\infty, 1] \cup [2, \infty)$

Example 4: Solve and graph.

a.) $-6 < -2(d-3) < 4$ b.) $3 - 2b \geq 1$ or $b - 6 > 4$ c.) $-2 - \frac{x}{4} \leq \frac{1+x}{3}$ d.) $-4 \leq \frac{9}{5}x + 32 \leq 68$

$$\begin{aligned} -2 & \quad -2 & \quad -2 & \quad -3 & \quad -3 & \quad +6 & \quad +6 \\ 3 & > d-3 & > -2 & \quad -2b & \geq -2 & \quad b > 10 \\ +3 & \quad +3 & \quad +3 & \quad -2 & \quad -2 & \quad b \leq 1 & \text{ or } b > 10 \\ 6 & > d & > 1 & & & & \end{aligned}$$

$6 > d > 1$

$1 < d < 6$
 $(-\infty, 1] \cup (10, \infty)$

$$\begin{aligned} 12(-2) - \left(\frac{x}{4}\right) & \leq \left(\frac{1+x}{3}\right) + \frac{4}{3} \\ -24 - 3x & \leq 4 + 4x \\ +3x & \quad +3x \\ -24 & \leq 4 + 7x \\ -4 & \quad -4 \end{aligned}$$

$$1 - a - 4 \quad (-\infty, 1] \cup (10, \infty)$$

$(1, 6)$

$$-24 \leq 4 + 4x$$

$$-4 \leq x$$

$$-28 \leq 7x$$

$$-4 \leq x$$

$$(-4 \leq x)$$



-4

$$[-4, \infty)$$

$$x > 5$$

