

ALG I - §3-1 NOTES

Algebra 1

Lesson 3.1: Inequalities and Their Graphs

Objective: To write, graph, and identify solutions of inequalities.

Warm-Up Simplify each.

1. $\frac{4}{5} \cdot \frac{4}{4} + \frac{3}{4} \cdot \frac{5}{5}$

$$= \frac{16}{20} + \frac{15}{20}$$

$$= \frac{31}{20} \text{ or } 1 \frac{11}{20}$$

2. $-2\frac{2}{5} \cdot 1\frac{1}{4}$

$$= \left(-\frac{12}{5}\right)\left(\frac{5}{4}\right)$$

$$= -3$$

3. $1\frac{4}{5} \div \frac{3}{4}$

$$= \frac{9}{5} \div \frac{3}{4}$$

$$= \frac{9^3}{5} \cdot \frac{4}{3}$$

$$= \frac{12}{5} \text{ or } 2\frac{2}{5}$$

Example 1 Write an inequality that represents each verbal expression.

a) w is greater than or equal to negative fifteen. $w \geq -15$

b) The quotient of m and ten is less than $\frac{2}{3}$. $\frac{m}{10} < \frac{2}{3}$

Example 2 Determine if the value make the inequality true or false.

a) $4x - 3 \leq -9$; $x = -2$

$$4(-2) - 3 \leq -9$$

$$-8 - 3 \leq -9$$

$$-11 \leq -9$$

True

b) $\frac{3-n}{2} < 4$; $n = -7$

$$\frac{3 - (-7)}{2} < 4$$

$$\frac{10}{2} < 4$$

$$5 < 4$$

False

Example 3 Match each inequality with its graph.

1) $a \geq -5$

C

A.



2) $-5 > m$

$m < -5$

A

B.



3) $-5 \geq v$

$v \leq -5$

B

C.

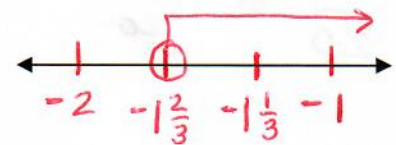
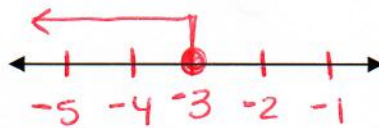
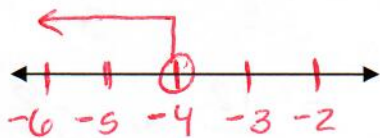


Example 4 Graph each inequality.

a) $t < -4$

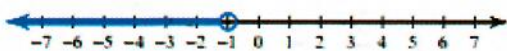
b) $f \leq -3$

c) $m > \frac{-5}{3}$ or $-1\frac{2}{3}$



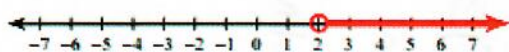
Example 5 Write an inequality for each graph.

a)



$x < -1$

b)



$x > 2$

c)



$x \geq 2$

Example 6 Define a variable and write an inequality to model each situation.

a) The oldest dog lived to be at most 29 years old.

let $d =$ age of the dog

$d \leq 29$

b) The student earned more than \$5,000 working during the summer.

let $m =$ money earned

$m > 5000$

c) The movie theatre had a least 50 people in it.

let $p =$ # of people

$p \geq 50$