

# 3-3

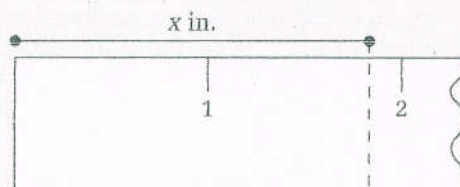
# Inequalities and Intervals

## FOCUS

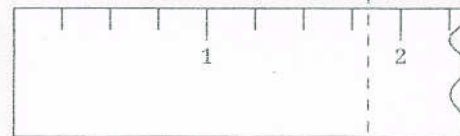
Use inequalities to describe number line graphs.

Precision in measurement is related to the unit of measure used; the smaller the unit of measurement, the greater the precision. The greatest possible error in a measurement is one half the unit of measure being used. Thus, the actual measure lies within an interval defined by the possible error.

Unit of measure: 1 in.  
 Length of segment: 2 in.  
 $1\frac{1}{2} \leq x \leq 2\frac{1}{2}$



Unit of measure:  $\frac{1}{4}$  in.  
 Length of segment:  $1\frac{3}{4}$  in.  
 $1\frac{5}{8} \leq x \leq 1\frac{7}{8}$



Unit of measure:  $\frac{1}{8}$  in.  
 Length of segment:  $1\frac{7}{8}$  in.  
 $1\frac{13}{16} \leq x \leq 1\frac{15}{16}$



## KEY TERMS

## EXAMPLE / ILLUSTRATION

<b>Inequality</b> (p. 144) a mathematical sentence that contains one of the symbols $<$ , $>$ , $\leq$ , or $\geq$	$7 > -2$
<b>Greater than or equal to</b> (p. 144) a relationship between quantities that uses the symbol $\geq$	$x \geq 6.4$
<b>Less than or equal to</b> (p. 144) a relationship between quantities that uses the symbol $\leq$	$r \leq 10$
<b>Interval</b> (p. 145) a segment on a number line that can be described by a combined inequality	$1 < x \leq 4$

## UNDERSTANDING THE MAIN IDEAS

### Graphing inequalities and intervals

The graph of a simple inequality like  $x \geq 5$  is the point 5 and all points to the right of 5 on a number line. The graph of the combined inequality  $-3 \leq x < 6$  on a number line consists of the point  $-3$  and all points between  $-3$  and 6, but *not* the point 6. The combined inequality  $-3 \leq x < 6$  is made up of two inequalities,  $x \geq -3$  and  $x < 6$ .

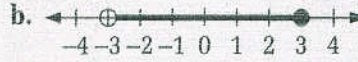
### Sample 1

Graph each inequality.

a.  $2.5 \leq x$

b.  $-3 < x \leq 3$

### Sample Response



### Sample 2

Graph an interval of the number line to represent the following statement. Then write an inequality to describe the graph.

The students at Fenmore High School range in age from 14 years old to 19 years old.

### Sample Response



$14 \leq a \leq 19$

Graph each inequality on a number line.

1.  $x \geq -1\frac{1}{2}$

2.  $0 < x \leq 5$

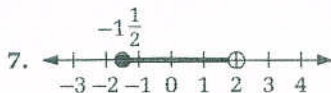
3.  $-2.4 \leq x \leq 1.6$

4.  $4 < x < 6$

5.  $-3 \leq x < 2$

6.  $-6 < x$

Write an inequality to describe each graph.



### Review PREVIEW

9. Find the mean, the median, and the mode of the data set below.  
(Section 3-2)

Hours worked during a one-week period by employees at Angie's Video Store: 32, 38, 42, 38, 35, 40, 42, 36, 39, 41, 34, 42

10. Give the square roots and the cube root of 64. (Section 2-9)
11. Make a bar graph of the data about honor roll students at King High School. (Toolbox Skill 22)

Class	Freshman	Sophomore	Junior	Senior
Number of honor roll students	35	33	38	29