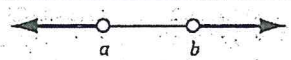
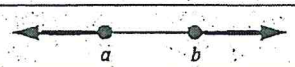
| Interval Notation | Inequality | Graph | Interval Notation |
|---|---|---|---|
| | $x>a$ |  | $(a,\infty)$ |
| | $x\geq a$ |  | $[a,\infty)$ |
| | $x<b$ |  | $(-\infty,b)$ |
| | $x\leq b$ |  | $(-\infty,b]$ |
| | $a<x<b$ |  | $(a,b)$ |
| | $a\leq x\leq b$ |  | $[a,b]$ |
| | $a\leq x<b$ |  | $[a,b)$ |
| | $a<x\leq b$ |  | $(a,b]$ |
| | $x<a \ \vee \ x>b$ |  | $(-\infty,a)\cup(b,\infty)$ |
| | $x\leq a \ \vee \ x\geq b$ |  | $(-\infty,a]\cup[b,\infty)$ |

**Linear Inequalities**

Let $a$, $b$ and $c$ be any real numbers (or algebraic expressions).

$a<b \Leftrightarrow b>a$ $\qquad$ $c>0 \Rightarrow a<b \Leftrightarrow ac<bc$

$a<b \Leftrightarrow a+c<b+c$ $\qquad$ $c<0 \Rightarrow a<b \Leftrightarrow ac>bc$

**Set Operations**

The *union* of sets $A$ and $B$, denoted $A\cup B$, is the set of all elements that are in either $A$ **or** $B$ (or both). $A\cup B=\{x\,|\,x\in A\vee x\in B\}$

The *intersection* of sets $A$ and $B$, denoted $A\cap B$, is the set of all elements that are in both $A$ **and** $B$. $A\cap B=\{x\,|\,x\in A\wedge x\in B\}$

**Absolute Value Equations and Inequalities**

Let $c>0$. Absolute value equations and inequalities can be rewritten without absolute values using the following equivalencies.

$|x|=c \Leftrightarrow x=c \ \vee \ x=-c$

$|x|<c \Leftrightarrow -c<x<c$

$|x|>c \Leftrightarrow x>c \ \vee \ x<-c$

$|ax+b|=c \Leftrightarrow ax+b=c \ \vee \ ax+b=-c$

$|ax+b|<c \Leftrightarrow -c<ax+b<c$

$|ax+b|>c \Leftrightarrow ax+b>c \ \vee \ ax+b<-c$