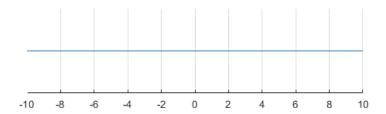
Real Number and intervals

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Real Number Line

 \mathbb{R}^1 : can write \mathbb{R}^1 or \mathbb{R} (you can add a superscript 1 to emphasize this is first Euclidean space, either notation is fine), is the real number line.

```
close all;
figure();
x = linspace(-10,10);
line(x,0*ones(size(x)))
set(gca,'ytick',[],'Ycolor','w','box','off')
ylim([-0.1 0.1])
pbaspect([4 1 1])
grid on
```



Non-negative numbers

In many economic problems, we have to restrict ourselves to numbers greater or equal to zero.

- We can not consume from negative numbers of apples
- We can not produce with negative labor and capital
- We would be infinitely unhappy (die) if there is zero consumption in a year

We can use the following notation to define the set of non-negative real numbers:

 $\mathbf{R}_{\geq 0} \equiv \{x \in \mathbf{R} : x \geq 0\}$, some authors use \mathbf{R}_{+} instead of $\mathbf{R}_{\geq 0}$

And use inequality sign to define the set of real numbers greater than zero:

$\mathbf{R}_{>0} \equiv \{x \in \mathbf{R} : x > 0\}$, some authors use \mathbf{R}_{++} instead of $\mathbf{R}_{>0}$

```
close all;
figure();
x = linspace(0,10);
line(x,0*ones(size(x)))
set(gca,'ytick',[],'Ycolor','w','box','off')
ylim([-0.1 0.1])
xlim([-10 10])
pbaspect([4 1 1])
grid on
```

