MAT137

- Alfonso has emailed the links for submitting problem set 1. If there is any problem, please contact him.
- For those of you who need a tutorial change, see the instructions on the website.
- Today we will discuss absolute value and inequality.
- Homework before Monday's class: watch videos 2.1, 2.2, 2.3.

Inequalities

Let $a, b, c \in \mathbb{R}$. Suppose that we know that $a < b$. Which of the following are definitely true?

1. $a + c < b + c$
2. $a < b + 7$
3. $ac < bc$
4. $a^2 < b^2$

Some sets

Rewrite the following sets as intervals.

1. $\{a \in \mathbb{R} : |a - 1| < 2\}$
2. $\{a \in \mathbb{R} : a + 7 < 10\}$
3. $\{a \in \mathbb{R} : \forall \delta > 0, |a - 1| < \delta\}$

Solve these inequalities

Find all x which make the following statements true.

1. $x^2 - 3x + 2 < 0$.
2. $|2x + 4| < 8$.
3. If $y \in \mathbb{R}$ and $2y < 4$, then $y < x$.

A funny function

Consider the function

$$f(x) = \frac{|x|}{x}$$

which is defined for $x \in \mathbb{R}, x \neq 0$.
What is its graph?

Triangle inequality

Let $a, b \in \mathbb{R}$. We know that

$$|a + b| \leq |a| + |b|$$

Why is this true? When do we get equality? What does this have to do with triangles?