Welcome to MAT137 - Calculus with proofs!

- Class begins at 11:10am ET
- Assignment 1 is due on October 1.
- Course website: http://uoft.me/MAT137
- Check the website for office hours.

- **Before next class:**
    - **Watch videos 2.1, 2.2, 2.3**
    - Download next class slides.
      No need to look at them.

Let $a, b, c \in \mathbb{R}$.
Assume $a < b$. What can we conclude?

1. $a + c < b + c$

2. $a - c < b - c$

3. $ac < bc$

4. $a^2 < b^2$

5. $\dfrac{1}{a} > \dfrac{1}{b}$

If any of the conclusions is wrong, figure out what additional conditions on a, b, c are required for it to be true.

What are the following sets? Describe them using intervals.

A = all real numbers of distance less than 1 from 7

$B = \{x \in \mathbb{R} \ : \ |x| < 0.5\}$

$C = \{x \in \mathbb{R} \ : \ 0 < |x - 3| < 0.2\}$

$D = \{x \in \mathbb{R} \ : \ |x + 4| < 1\}$

Find *all* positive values of A, B, and C which make the following implications true.

1. $|x - 3| < 1 \implies |2x - 6| < A$
2. $|x - 3| < B \implies |2x - 6| < 1$
3. $|x - 3| < 1 \implies |x + 5| < C$