MAT137 (Section L0501, October 09, 2019)

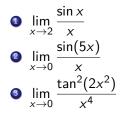
• For next day's lecture, watch videos 3.1,3.2,3.3,3.4,3.5 and 3.8

- Today's lecture will assume you have watched videos till 2.22.
- No class on Monday

- Computations
- IVT
- SEVT

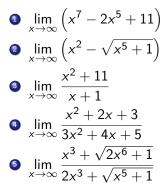
Computations!

Using that $\lim_{x\to 0} \frac{\sin x}{x} = 1$, compute the following limits:

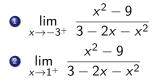


 $\lim_{x \to 0} \frac{\sin e^x}{e^x}$ $\lim_{x \to 0} \frac{1 - \cos x}{x}$ $\lim_{x \to 0} \frac{\tan^{10}(2x^{20})}{\sin^{200}(3x)}$

Compute:



Compute:



Prove that the equation

$$x^4 - 2x = 100$$

has at least two solutions.

In each of the following cases, does the function f have a maximum and a minimum on the interval I?

a
$$f(x) = x^2$$
, $I = (-1, 1)$.

b $f(x) = \frac{(e^x + 2)\sin x}{x} - \cos x + 3$, $I = [2, 6]$
c $f(x) = \frac{(e^x + 2)\sin x}{x} - \cos x + 3$, $I = [-2, 2]$

- Prove that there exists a time of the day when the hour hand and the minute hand of a clock form an angle of exactly 23 degrees.
- Ouring a Raptors basketball game, at half time the Raptors have 51 points. Prove that at some point they had exactly 26 points.
- Prove that at some point during Sourav's life, his height in centimetres was exactly equal to 10 times his weight in kilograms. Some data:
 - His height at birth: 47 cm
 - His weight at birth: 3.2 kg
 - His height today: 172 cm

We did not solve this in class, but solve this as an exercise

