



LESSON 28

MA 16100 · FALL 2022

DR. HOOD



WARM UP

Evaluate the limit:

$$\lim_{x \rightarrow 1} \frac{x^2 - x}{x^2 - 1} = \frac{0}{0}$$

$$= \lim_{x \rightarrow 1} \frac{x(\cancel{x-1})}{(\cancel{x-1})(x+1)} = \frac{1}{1+1} = \frac{1}{2}$$

a) 0

b) 1

c) $\frac{1}{2}$

ANNOUNCEMENTS

- Dr. Hood's Office Hours in Math 844
 - **Friday Nov 4 at 2-3pm**
- TA's Office Hours in the [Math Resource Room](#)
 - WTHR 313
 - Mon – Thu from 9:30am – 8:30pm
 - Fri from 9:30am – 3:30pm

ANNOUNCEMENTS

- Thanksgiving Break
 - University Holiday is Wed Nov 23 – Fri Nov 25
 - MA 161 additional breaks:
 - No class on Mon Nov 21
 - No recitation on Tue Nov 22
 - No HW or Quizzes that week
 - No Office Hours on Mon Nov 21
 - Math Resource Room closed Mon Nov 21 – Fri Nov 25

POLL 1

Use L'Hopital's Rule to evaluate:

$\frac{0}{0}$

$$\lim_{x \rightarrow 2} \frac{x^2 + x - 6}{x^2 - 4}$$

$$\textcircled{L} = \lim_{x \rightarrow 2} \frac{2x+1}{2x} = \frac{5}{4}$$

a) $\frac{5}{4}$

b) 1

c) $\frac{3}{2}$

POLL 2

Discussion Question:

$$\lim_{x \rightarrow \infty} \left(1 + \frac{1}{x} \right)^x = 1?$$

$$\approx (1)^x = 1$$

$$\approx (1+h)^x > 1$$

a) True

b) False

c) Not sure

x	$f(x)$
10	2.593
100	2.705
1000	2.717
10^4	2.718

POLL 3

Consider $f(x) = x^2$ and $g(x) = 2^x$. Which function grows faster as $x \rightarrow \infty$?

a) x^2

$$\lim_{x \rightarrow \infty} \frac{x^2}{2^x} \rightarrow \frac{\infty}{\infty}$$

b) 2^x

$$\begin{aligned} \textcircled{L} \lim_{x \rightarrow \infty} \frac{2x}{2^x (\ln 2)} &= \textcircled{C} \lim_{x \rightarrow \infty} \frac{2}{2^x (\ln 2)^2} \\ &= 0 \end{aligned}$$

c) They grow at the same rate

2^x grows faster than x^2