

## Announcements

Today is the last day to submit **Quiz #5 regrade requests**

WeBWork #12 is due **Friday, April 8 at 9pm**

- Covers material from “Week 12”—see syllabus on course web page

**Solutions to (all versions of) Quiz #6 are online**

- Quiz #6 papers will be available in the MLC starting Thursday
- Grades will be posted in Connect by Friday

Wednesday and Friday in class: review

- **You tell me what to review! Comment on Piazza post**
- We'll also talk about the final exam

Monday, April 4

# Clicker Questions

# Clicker Question 1

## Finding a Taylor series

The Taylor series for the function  $f(x) = 1/(x - 5)^3$  centred at  $a = 7$  has the form

$$c_0 + c_1(x - 7) + c_2(x - 7)^2 + c_3(x - 7)^3 + c_4(x - 7)^4 + \dots$$

The five numbers below are  $c_0, c_1, c_2, c_3, c_4$  in some order. Which one is  $c_3$ ?

A.  $-\frac{5}{32}$

B.  $\frac{1}{8}$

C.  $\frac{3}{16}$

D.  $-\frac{3}{16}$

E.  $\frac{15}{128}$

## The calculation

The Taylor series at  $a$  for a function  $f(x)$  is

$$\sum_{n=0}^{\infty} \frac{f^{(n)}(a)}{n!} (x - a)^n,$$

so  $c_3 = f^{(3)}(7)/3! = f'''(7)/6$ . Since

$$f'''(x) = (-3)(-4)(-5)/(x - 5)^6,$$

we get  $f'''(7) = (-60)/2^6 = -15/16$ .

## Clicker Question 2

### Recognizing power series

Which of the following series converges to  $1/2$ ?

A. 
$$\sum_{n=0}^{\infty} (-1)^n \frac{(\pi/6)^{2n+1}}{(2n+1)!} = \sin \frac{\pi}{6} = \frac{1}{2}$$

B. 
$$\sum_{n=0}^{\infty} (-1)^n \frac{(\pi/3)^{2n}}{(2n)!} = \cos \frac{\pi}{3} = \frac{1}{2}$$

C. 
$$\sum_{n=0}^{\infty} \frac{(-\ln 2)^n}{n!} = e^{-\ln 2} = \frac{1}{2}$$

D. 
$$\sum_{n=1}^{\infty} -\frac{(1 - \sqrt{e})^n}{n} = \ln(1 - (1 - \sqrt{e})) = \frac{1}{2} \text{ (note: } |1 - \sqrt{e}| < 1)$$

E. 
$$\sum_{n=1}^{\infty} \frac{4^{n-3/2}}{5^n} = \frac{4^{-1/2}/5^1}{1 - 4/5} = \frac{1}{2} \text{ (note: } |\frac{4}{5}| < 1)$$

Monday, April 4

“More than Math Mondays”

Monday, April 4

If your good friend said “MATH 101 is hard sometimes”

- You would **never** say:
  - You're no good at math.
  - You never know how to do the problems.
  - I think you're just stupid.
  - You're going to fail.

If your good friend said “I worry about how I look”

- You would **never** say:
  - Yeah, you're fat.
  - You're just not attractive.
  - Nobody's going to want to be with you—like, ever.

If your good friend said “I feel overwhelmed with things”

- You would **never** say:
  - You're not good enough.
  - You need to be perfect.
  - You should be ashamed of yourself.

## So when we think “MATH 101 is hard sometimes”

- Why would we **ever** say to ourselves:
  - I'm no good at math.
  - I never know how to do the problems.
  - I think I'm just stupid.
  - I'm going to fail.

## So when we think “I worry about how I look”

- Why would we **ever** say to ourselves:
  - Yeah, I'm fat.
  - I'm just not attractive.
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## So when we think “I feel overwhelmed with things”

- Why would we **ever** say to ourselves:
  - I'm not good enough.
  - I need to be perfect.
  - I should be ashamed of myself.

Monday, April 4

### Don't

Don't say anything to yourself that you wouldn't ever say to a good friend of yours.

### Do

Continue to get better at listening to what you say to yourself, so you can shape that narrative.

### Don't

Don't imagine you have to be perfect and succeed perfectly at everything. That's not a thing. Nobody will ever be perfect, and we all fail sometimes (and that's a scary thought).

### Do

Do remember: **You are good enough, right now, "as is"**. And you always will be, because you'll always try your best.