§5.1: CONSTRUCTING ACCURATE GRAPHS OF ANTIDERIVATIVES

Dr. Mike Janssen

April 14, 2021

ANNOUNCEMENTS

- CoL 3: November 23 (Monday before Thanksgiving)
- CoL 3 interviews: done over Zoom the last week of class

A SUBTHEME OF THE COURSE

Question: Given the derivative of an unknown function f, how much information can we obtain about f itself?

A SUBTHEME OF THE COURSE

Question: Given the derivative of an unknown function f, how much information can we obtain about f itself?

Some answers:

A SUBTHEME OF THE COURSE

Question: Given the derivative of an unknown function f, how much information can we obtain about f itself?

Some answers:

Given real numbers $a \leq b$,

$$f(b) = f(a) + \int_a^b f'(x)\,dx.$$

ACTIVITY 5.1.2

TAKEAWAY

If F and G are antiderivatives of the same function, then $F - G$ must be a constant.

TAKEAWAY

If F and G are antiderivatives of the same function, then $F - G$ must be a constant.

Example: Consider $f(x) = 2x$.

ACTIVITY 5.1.3

FUNCTIONS DEFINED BY INTEGRALS

We can carry this further for continuous functions f:

$$A(x) = \int_a^x f(t)\,dt$$

is known as an integral function.

FUNCTIONS DEFINED BY INTEGRALS

We can carry this further for continuous functions f:

$$A(x) = \int_a^x f(t)\,dt$$

is known as an integral function. What information does it give us?

ACTIVITY 5.1.4