Fundamental Thoughts (Lecture Assignment)

Complete this assignment and submit it to Gradescope by 4:00pm on your class day. You can print this sheet, or write on your own paper. Contact us if internet connections or other issues require alternate arrangements.

1. Evaluate the following:

   (a) $\frac{d}{dx}\int_3^x \cos\left(e^t\right) dt$

   $\cos(e^x)$

   (b) $\frac{d}{dx}\int_x^4 \cos\left(e^t\right) dt$

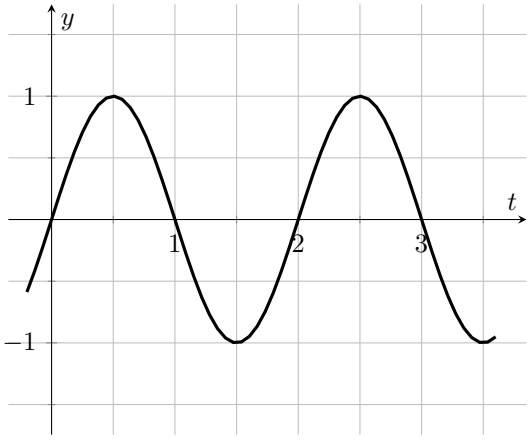
   $-\cos(e^x)$

2. Consider the function $g(x) = \int_1^x \sin(\pi t)\, dt$ with domain $0 \le x \le 3$.

   (a) For which x is $g(x) = 0$?

   1

   $\Rightarrow \int_a^b f(t)\,dt$, when $a = b \Rightarrow 0$



   (b) On which open intervals is $g(x)$ decreasing?

   $\sin(x\pi) = \frac{d}{dx} g(x)$ $\Rightarrow (1,2)$

   0 + π − 2π + 3π

One-Minute Questions: Write a sentence for each.

A. What's one mathematical question you have after watching the videos?

I was wondering how integrals work with polar coords

B. What's one interesting thing you learned from the book or videos?

One interesting thing was that you can swap bounds of an integral by multiplying the $\int$ by -1. Never thought abt that.