Grading and remarks for Lab 11

1 In 1.(a), 1.(b) and 1.(c) I awarded 2 points for the correct answer, 1 point for an attempt with some mistakes but still on the right track, 0.5 for a confused attempt. Note that the derivative of $\sin(x^2)$ is $\cos(x^2)2x$! Be careful with chain rule and do not get confused between $\cos(x^2)$ and $\cos^2(x)$. In general, if you have $\int_a^{g(x)} f(t)dt$, then the derivative of such a function is, by chain rule, $f(g(x))g'(x)$.

Note that $|x|$ means exactly: x if $x \geq 0$ and $-x$ if $x < 0$. Also, be careful when you interpret the integral as an area, since the order of integration matters (if you take the integral from the bigger number to the smaller one you gain an additional negative sign!). Note that if a function is defined as $\int_a^x f(t)dt$, then no constant C is present (it is not an indefinite integral).

In 1.(d) I awarded 2 points for a fully correct answer, 1.5 for saying that $G'x)$ is not continuous at 0 ($G'(0)$ does not exists at all, it is not $g(0)$), 1 point for a confuse phrasing referring to the TFC, 0 otherwise.

In 1.(e) I awarded 0.5 points for the graph, 0.5 points for $H'(1)$ and $H(x)$ being an antiderivative of $h(x)$, 1 point for the correct formula for $H(x)$.

In 1.(f) I gave one point for a correct graph (same y values, the second stretched along the x-axis, and 1 point for getting the relation between the two integrals.

As general remark, if you have $F(x) = \int_a^x f(y)dy$, then if you find a formula for $F(x)$ that does not involve integrals, then y should not appear.

2 For 2.(a) i awarded 0.5 for understanding that you needed to use integration by parts seeing 1 as the derivative of x; I awarded 1 point for doing the first step of by parts correctly, I gave 1.5 for an almost correct solution, 2 points for the correct answer. Note, I made a Canvas announcement saying that the integral was up to 1 and not to $\pi/2$. Nevertheless I gave credit for consistent work, even if the wrong integral was approached.

For 2.(b) I gave 1 for the right approach with integration by parts and 2 for the correct answer.

[3] In 3.(a) I awarded 0.5 for computing the antiderivative of the function without absolute value. I awarded one point for understanding the integral had to be broken into three pieces: from 0 to 1, from 1 to 2 and from 2 to 3 (i.e. where the argument of the absolute value changes sign). I awarded 1.5 for a correct procedure with computational mistakes and 2 points for the correct answer.

In 3.(b) I gave 0.5 for the right choice of u-substitution, 1 point for the first step of the substitution, 1.5 for an almost correct solution, 2 for the correct one. Be careful when you do u-substitution, since you need to change the domain of integration.

In 3.(c) I gave 1 for some words about the symmetry of the domain and 2 for the correct answer, i.e. that it is the integral of an odd function over a symmetric domain.

In general, note that the integral of a strictly positive function has to be positive!!!

4 *In all points I awarded 0.5 for understanding the integration technique to use, 1 for doing the first step, 1.5 for a solution with minor numerical error, 2 for a correct answer.*