Practice with partial derivatives

Let $f(x, y) = xe^{xy}$. Compute $f_x(1, 2)$.

(a) e^2

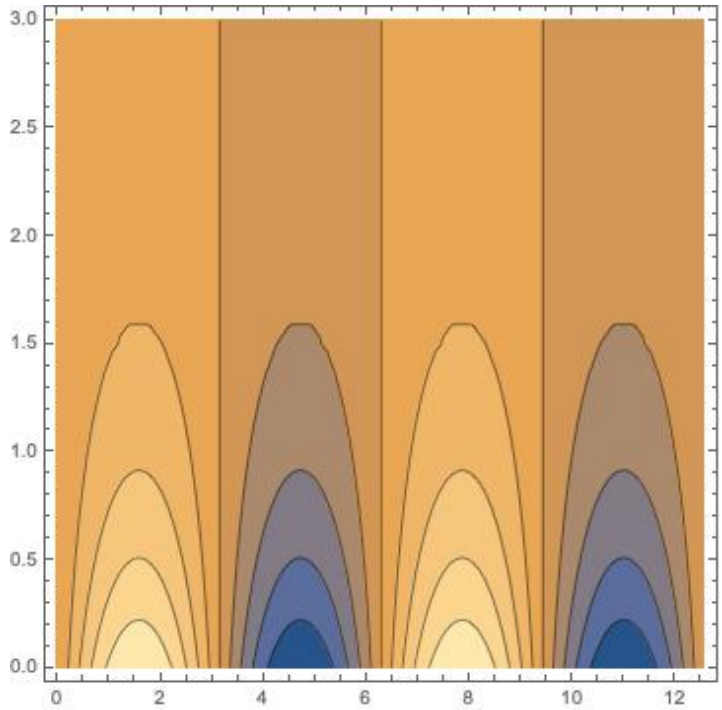
(b) $2e^2$

(c) $3e^2$

(d) $4e^2$

Contour graphs and partial derivatives

The following shows the contour graph of a function $f(x, t)$. Here the horizontal axis is the x-axis, and the vertical axis is the t-axis. The dark colours indicate regions of where f is negative, while the lighter colours indicate regions where f is positive.
What can you say about f_t and f_{xx} at the point $(x, t) = (\frac{\pi}{2}, 1.25)$?



(a) $f_t < 0, f_{xx} < 0$

(b) $f_t > 0, f_{xx} = 0$

(c) $f_t < 0, f_{xx} = 0$

(d) I don't know.

Midterm 1

When is the first midterm?

(a) Tomorrow (Tuesday, February 5)

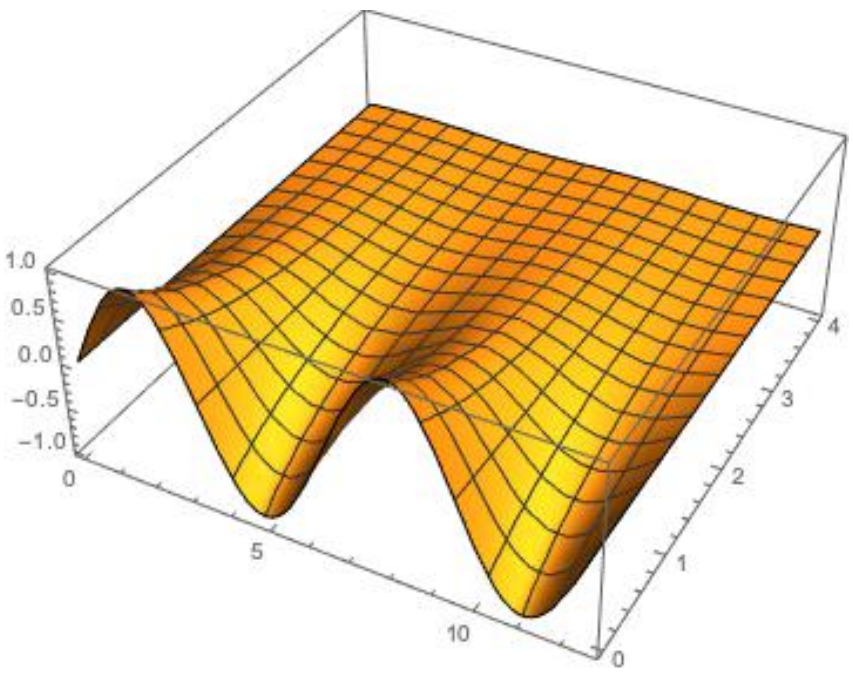
(b) Tuesday, February 12

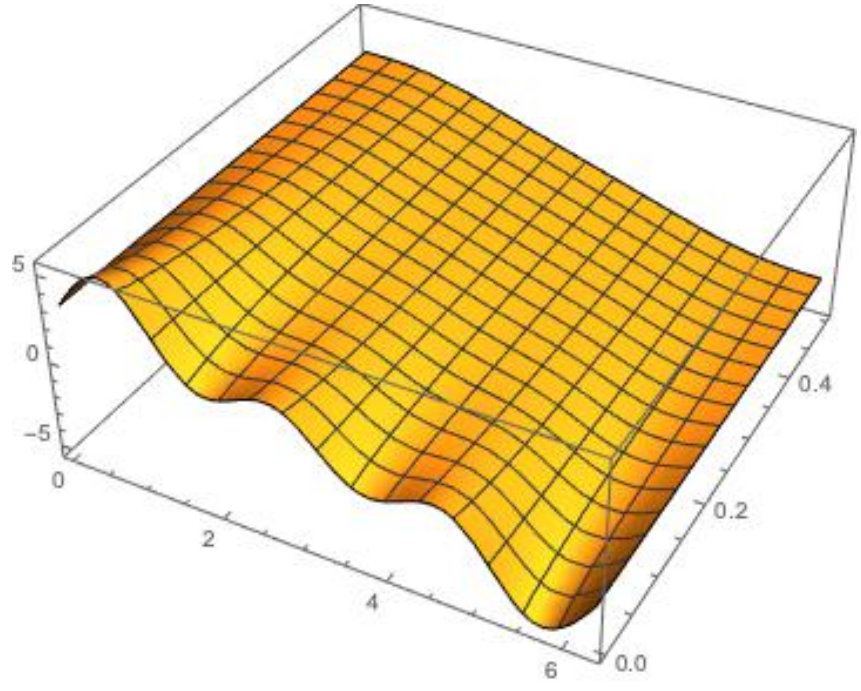
(c) Tuesday, Feburary 19

(d) There are no midterms in this course

- Official time: 7:15–8:15pm, but please arrive by 7:00pm to find your seat.
- Check the exam webpage to find the location (based on your discussion section).
- If you need to sign up for a conflict exam or DRES accommodations, the deadline to do so is tomorrow, Tuesday 5 February.

Solutions to the heat equation





(Slice at $t = 0$ shows the initial temperature along the rod.)

Linearization and linear approximation

Consider the function $f(x, y) = xe^{xy}$. We have

$$\frac{\partial f}{\partial x}(x, y) = e^{xy} + xye^{xy}$$
$$\frac{\partial f}{\partial y}(x, y) = x^2 e^{xy}.$$

Use this information to write down the linearization $L(x, y)$ of $f(x, y)$ at the point $(1, 0)$. Use L to approximate the value of $f(1.1, -0.1)$.

(a) $f(x, y) \approx 1$.

(b) $f(x, y) \approx 0$.

(c) I cannot do this without a calculator.

(d) I don't understand the question.