Obligatorisk oppgave 1, MEK1100, Vår 2021

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Oppgave 3

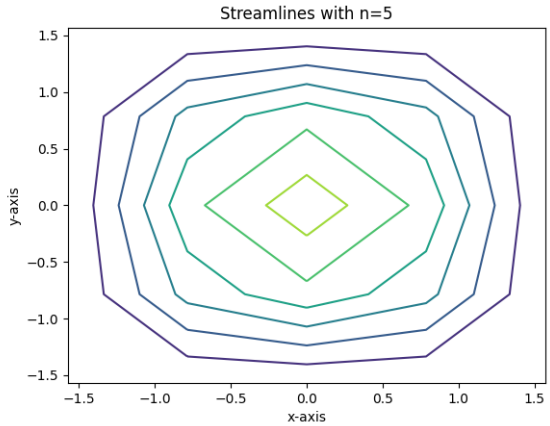
a)

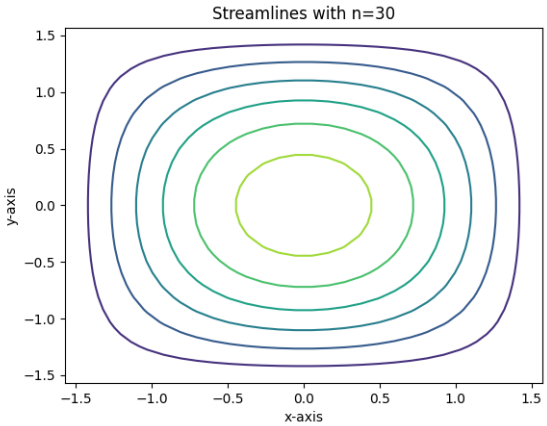
Oppgave 4

a)

```python
import numpy as np
import matplotlib.pyplot as plt
import abspath
from streamfun import streamfun

# Local pypackage that I created to easily access the
    absolute path of some selected directories.
path = abspath.get_path("MEK1100") + "/Oblig1/images"

# different values of n
n_vals = [5, 30]

# loops through different values for n and outputs .png files
for i in n_vals:
    x, y, psi = streamfun(i)
    plt.clf()
    plt.contour(x, y, psi)
    plt.title(f"Streamlines with n={i}")
    plt.xlabel("x-axis")
    plt.ylabel("y-axis")
    plt.savefig(f"{path}/strlin_{i}.png")
```

Koden over gir to plotter:

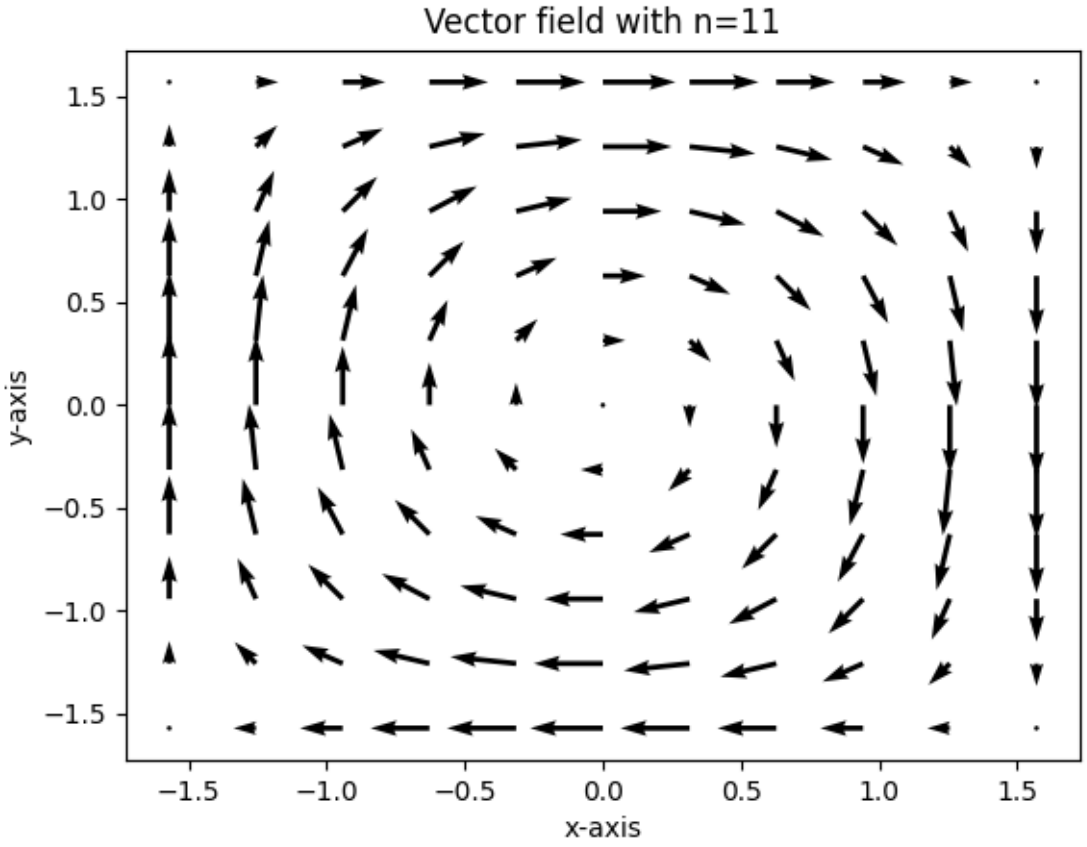




b)

```python
import numpy as np
import matplotlib.pyplot as plt
import abspath
from velfield import velfield

# Local pypackage that I created to easily access the absolute path of some selected directories.
path = abspath.get_path("MEK1100") + "/Oblig1/images"

# Chose an odd number to include the point in the middle where ther is no flow.
n_val = 11

# Gets values x, y, u and v, then plots them into the vector field.
x, y, u, v = velfield(n_val)
plt.quiver(x, y, u, v)
plt.title(f"Vector field with n={n_val}")
plt.xlabel("x-axis")
plt.ylabel("y-axis")
plt.savefig(f"{path}/vec_{n_val}.png")
```

Koden over gir vektorfeltet under:


Vector field with n=11
y-axis
x-axis
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−1.5
−1.0
−0.5
0.0
0.5
1.0
1.5