Name: SalahDin Ahmed Salh Rezk
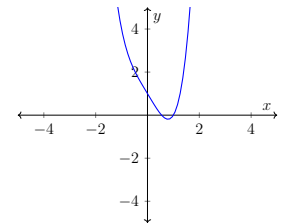ID: 202201079
Date: November 13, 2023

# COURSE (CODE)
Assignment #
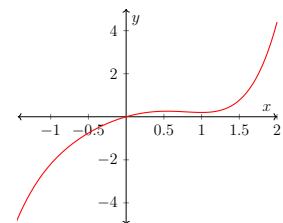
1. Question Number 1

$$f(x) = x^4 - 2x + 1 \tag{1}$$

$$F(x) = \int_0^x f(t)\,dt. \tag{2}$$

2. Question Number 2

```python
import numpy as np
import matplotlib.pyplot as plt

def f(x):
"""Function to integrate."""
return x**4 - 2*x + 1

def integral(x):
"""Analytical solution of the integral of f(x)."""
return (1/5)*x**5 - x**2 + x

# Plotting
fig, ax = plt.subplots()
x = np.linspace(0, 2, 100)
ax.plot(x, f(x), label='f(x)')
ax.plot(x, integral(x), label='F(x)')
plt.show()
```



(a) $f(x) = x^4 - 2x + 1$



(b) $F(x) = \frac{1}{5}x^5 - x^2 + x$

3. Question Number 3

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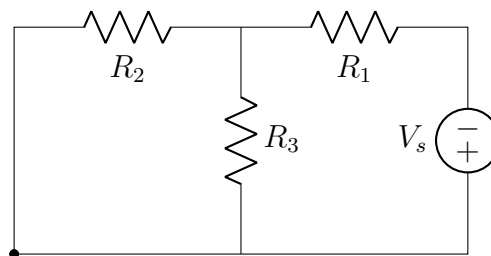


Figure 2

1