

2-0Notes-graphing

November 16, 2023

1 Cubic Polynomial Function Graph

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[39]: # Cubic Polynomial Function Graph
import numpy as np
import matplotlib.pyplot as plt

# Enables use of LaTeX in text
plt.rcParams['text.usetex'] = False

# Define the cubic polynomial function
def cubic_polynomial(x, scale_factor=1):
    return scale_factor * (x + 7) * x * (x - 7)

# Generate x values
x = np.linspace(-10, 10, 100)

# Generate y values
scale_factor = 0.05
y = cubic_polynomial(x, scale_factor)

# Create a new figure and axes
fig, ax = plt.subplots()

# Plot the graph
ax.plot(x, y, label=r'$y=\frac{1}{20}(x+7)x(x-7)$')

# Remove the grid
ax.grid(False)

# Remove the box around the graph
ax.set_frame_on(True)

ax.spines['left'].set_position('center')
ax.spines['bottom'].set_position('center')
ax.spines['right'].set_color('none')
ax.spines['top'].set_color('none')
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# Change the range of the y axis to +/- 10
ax.set_ylim(-10, 10)

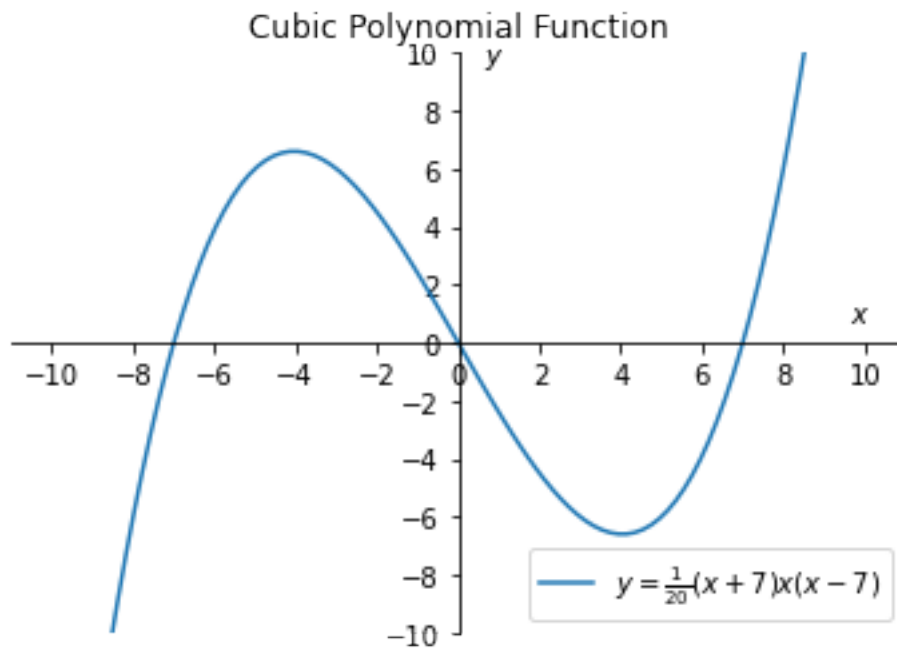
# Set the x labels
ax.set_xticks(np.arange(-10, 11, 2))
ax.set_yticks(np.arange(-10, 11, 2))

# Place a label "x" above the right end of the x axis
ax.text(10, 0.5, "x", va='bottom', ha='right', style='italic')
ax.text(1, 9.5, 'y', va='bottom', ha='right', style='italic')

# Add a title and legend
ax.set_title('Cubic Polynomial Function')
ax.legend(loc='lower right')

# Show the graph
plt.show()

```



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[40]: # Cubic plot with LaTeX

# Enables use of LaTeX in text
plt.rcParams['text.usetex'] = True

# Define the cubic polynomial function
def cubic_polynomial(x, scale_factor=1):

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    return scale_factor * (x + 7) * x * (x - 7)

# Generate x values
x = np.linspace(-10, 10, 100)

# Generate y values
scale_factor = 0.05
y = cubic_polynomial(x, scale_factor)

# Create a new figure and axes
fig, ax = plt.subplots()

# Plot the graph
ax.plot(x, y, label=r'$y=\frac{1}{20}(x+7)x(x-7)$')

# Remove the grid
ax.grid(False)

# Remove the box around the graph
ax.set_frame_on(True)

ax.spines['left'].set_position('center')
ax.spines['bottom'].set_position('center')
ax.spines['right'].set_color('none')
ax.spines['top'].set_color('none')

# Change the range of the y axis to +/- 10
ax.set_ylim(-10, 10)

# Set the x labels
ax.set_xticks(np.arange(-10, 11, 2))
ax.set_yticks(np.arange(-10, 11, 2))

# Place a label "x" above the right end of the x axis
ax.text(10.5, 0.5, 'x', va='bottom', ha='right', style='italic')
ax.text(1, 9.5, 'y', va='bottom', ha='right', style='italic')

# Add a title and legend
ax.set_title('Cubic Polynomial Function')
ax.legend(loc='lower right')

# Show the graph
plt.show()

```

