Code 03 - Plotting Graph

Example 01

```
from manim import *

class Myscene(Scene):

    def construct(self):

        axes = Axes()
        axes.add_coordinates()

        self.play(Create(axes), run_time=5)
        self.wait(5)
```

Example 02

```
from manim import *

class Myscene(Scene):

    def construct(self):

        axes = Axes(
             y_range = [0, 8, 1],
             x_range = [0,8,0.5],
             x_length = 12,
        )
        axes.add_coordinates()


        self.add(axes)

        graph = axes.plot(lambda x: x**2,
                          color = YELLOW,
                           x_range = [0,2]
                          )

        self.add(graph)
```

Exmaple 03

```
from manim import *

class Myscene(Scene):

    def construct(self):

        axes = Axes(
            y_range = [0, 8, 1]
        )
        axes.add_coordinates()


        self.play(Write(axes))
        self.wait(1)

        graph = axes.plot(lambda x: x**2,
                          color = YELLOW,
                          )

        area = axes.get_area(graph,
                        x_range =[-3,3],
                        color = RED,
                        opacity=0.5,
                        )

        self.play(Write(graph))
        self.play(Write(area))
        self.wait(5)
```

Example 04

```
from typing_extensions import runtime
from manim import *

class Myscene(Scene):

    def construct(self):

        axes = Axes(
            y_range = [0, 8, 1],
            x_range = [-4, 4, 1],
            x_length= 7,
            y_length = 6,
        )
        axes.add_coordinates()
        x_label = axes.get_x_axis_label("x")
        y_label = axes.get_y_axis_label("x^2")

        self.play(Write(axes))
        self.wait(1)

        graph = axes.plot(lambda x: x**2,
                          color = YELLOW,
                          x_range = [-3,3]
                          )

        self.play(Write(graph), Write(x_label), Write(y_label), run_time = 3)
        self.wait()

        x = ValueTracker(2)
        dx = ValueTracker(0.5)
        secant = always_redraw(lambda : axes.get_secant_slope_group(
            x = x.get_value(),
            dx = dx.get_value(),
            graph = graph,
            secant_line_length=5,
            secant_line_color= BLUE,
            dx_line_color = RED,
            dy_line_color = RED,
            dx_label = "dx",
            dy_label = "dy",
        ))

        dot = always_redraw(lambda : Dot(axes.c2p(x.get_value(),
                graph.underlying_function(x.get_value()))))
                                # Dot(axes.c2p(x,y))
        self.play(Create(secant))
        self.wait()
        self.play(dx.animate.set_value(0.001), run_time=3)
        self.play(Create(dot))
        self.wait()
        self.play(x.animate.set_value(-3), run_time = 5)
        self.wait(1)
```