R Program for Plotting a Parametric Curve

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Task

Write an R program that calculates the coordinates of points on a parametric curve and plots it.

Description

A parametric curve is defined by the following equations:

$$x(t) = 3\cos(t)$$

$$y(t) = 2\sin(t)$$

The parameter range is from 0 to π. The program should:

1. Calculate the coordinates of the curve points for different values (dividing the range into 20 equal parts).
2. Plot the curve using the calculated values.

Sample Expected Output

The coordinates of the curve points should be displayed as follows:

```
t = 0.0000 : (x, y) = (3.0000, 0.0000)
t = 0.1653 : (x, y) = (2.9591, 0.3292)
t = 0.3307 : (x, y) = (2.8375, 0.6494)
t = 0.4960 : (x, y) = (2.6384, 0.9519)
t = 0.6614 : (x, y) = (2.3674, 1.2284)
t = 0.8267 : (x, y) = (2.0318, 1.4714)
t = 0.9921 : (x, y) = (1.6408, 1.6743)
t = 1.1574 : (x, y) = (1.2051, 1.8315)
t = 1.3228 : (x, y) = (0.7365, 1.9388)
t = 1.4881 : (x, y) = (0.2477, 1.9932)
t = 1.6535 : (x, y) = (-0.2477, 1.9932)
```

```
t = 1.8188 : (x, y) = (-0.7365, 1.9388)
t = 1.9842 : (x, y) = (-1.2051, 1.8315)
t = 2.1495 : (x, y) = (-1.6408, 1.6743)
t = 2.3149 : (x, y) = (-2.0318, 1.4714)
t = 2.4802 : (x, y) = (-2.3674, 1.2284)
t = 2.6456 : (x, y) = (-2.6384, 0.9519)
t = 2.8109 : (x, y) = (-2.8375, 0.6494)
t = 2.9762 : (x, y) = (-2.9591, 0.3292)
t = 3.1416 : (x, y) = (-3.0000, 0.0000)
```

Image of Sample Plot

Notes

- You may use either the `ggplot2` or `plot` package for plotting.
- Commenting your code (adding brief explanations) will be part of the evaluation.