Calculus 2 Workbook

Parametric curves

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ELIMINATING THE PARAMETER

1. Eliminate the parameter.

$$x = t^2 - 2$$

$$y = 8 - 3t$$

$$t \geq 0$$

DERIVATIVES OF PARAMETRIC CURVES

■ 1. Find the derivative of the parametric curve.

$$x = 3 + \sqrt{t}$$

$$y = t^2 - 5t$$

■ 2. Find the derivative of the parametric curve.

$$x = 4\cos t$$

$$y = t - 5\sin t$$

■ 3. Find the derivative of the parametric curve.

$$x = 7\cos t$$

$$y = 3t^2 - t$$

■ 4. Find the derivative of the parametric curve.

$$x = e^t - 3t$$

$$y = e^{-t} + 2t$$

5. Find the derivative of the parametric curve.

$$x = 7t - 4$$

$$y = 5t^2 + 9t$$

SECOND DERIVATIVES OF PARAMETRIC CURVES

1. Find the second derivative of the parametric curve.

$$x = 1 - \cos^2 t$$

$$y = \sin t$$

2. Find the second derivative of the parametric curve.

$$x = e^{-3t}$$

$$y = e^{2t^2}$$

3. Find the second derivative of the parametric curve.

$$x = t^2 + 2t + 1$$

$$y = 3t + 4$$

SKETCHING PARAMETRIC CURVES BY PLOTTING POINTS

■ 1. The graph of the parametric equation on the interval $0 \leq t \leq 2$ is a segment. What is the Cartesian equation in x and y? Find the left and right endpoints of the segment.

$$x = 2t + 3$$

$$y = 4t + 5$$

■ 2. What are the points on the curve for the parameter values $t = 1, 2, 3,$ and 4?

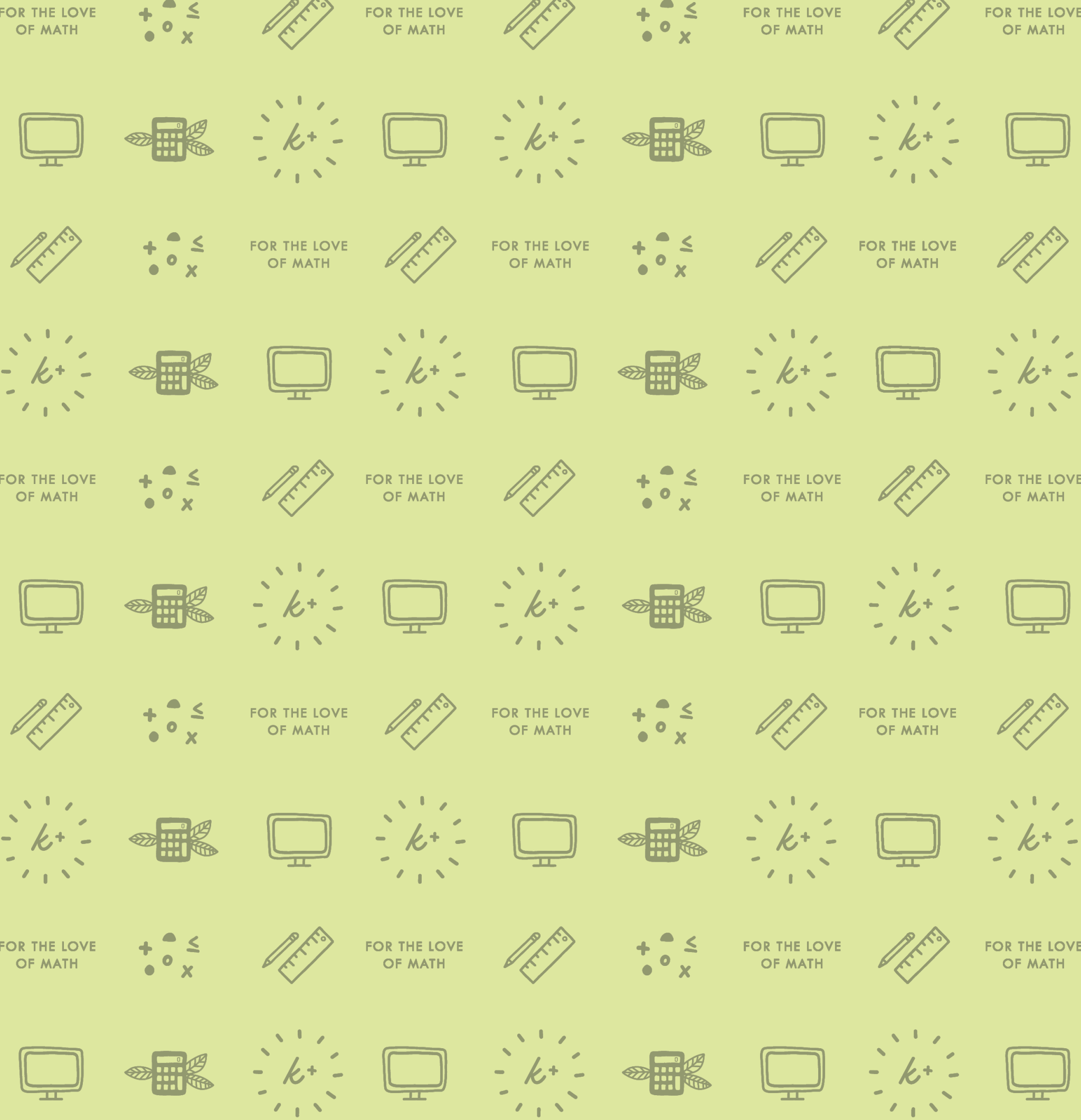
$$x = t^2 + t$$

$$y = t^2 - t$$

■ 3. What are the points on the curve for the parameter values $t = 0, 1, 2,$ and 3?

$$x = 3t^2 - 5$$

$$y = 2t^3 + 1$$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