

Collaborators:

Colley 3.1 #3 Sketch the images of the following paths, using arrows to indicate the direction in which the parameter increases:

$$\begin{cases} x = t \cos t \\ y = 2 \sin 2t \end{cases}, -6\pi \leq t \leq 6\pi.$$

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Colley 3.1 #10 Calculate the velocity, speed, and acceleration of the following path:

$$\mathbf{x}(t) = (e^t, e^{2t}, 2e^t)$$

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Colley 3.1 #17 Find an equation for the line tangent to the given path at the indicated value for the parameter.

$$\mathbf{x}(t) = (t^2, t^3, t^5), \quad t = 2.$$

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Colley 3.2 #1 Calculate the length of the following path:

$$\mathbf{x}(t) = (2t + 1, 7 - 3t), \quad -1 \leq t \leq 2.$$

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Colley 3.2 #4 Calculate the length of the following path:

$$\mathbf{x}(t) = 7\mathbf{i} + t\mathbf{j} + t^2\mathbf{k}, \quad 1 \leq t \leq 3.$$

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Colley 3.2 #13 This problem concerns the path $\mathbf{x} = |t - 1|\mathbf{i} + |t|\mathbf{j}, -2 \leq t \leq 2$.

- (a) Sketch this path.
- (b) The path fails to be of class C^1 but is piecewise C^1 . Explain.
- (c) Calculate the length of this path.

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