Parametric Equations Assignment

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Parametric Equations Assignment

Question 0

Watch the lecture video here.

Did you watch the video? [Type yes or no.]

Question 1

Graph the parametric equations $x(t) = \sin(t + \sin(t))$ and $y(t) = \cos(t + \cos(t))$ for $t = 0$ to $t = 2\pi$.

Question 2

Consider the parametric equations $x(t) = \sin(2t)$ and $y(t) = \sin(3t)$.

Part a

Graph these equations from $t = 0$ to $t = 2\pi$.

Part b

What values of t result in the point $\left(\frac{\sqrt{3}}{2}, 0\right)$? (see Example 5)

Part c

Find the derivative $\frac{dy}{dx}$ (this will be a function of t).

Part d

Find the slopes for the values of t you found in part (b). [There are two answers.]

Part e

Find equations for the tangent lines at $\left(\frac{\sqrt{3}}{2}, 0\right)$. [There are two tangent lines.]

Part f

Add the tangent lines to the graph above (For the tangent line plots, use $xmin = -1,\ xmax = 1.5,\ ymin = -1,\ ymax = 1$).

Question 3

Return to Example 2 and try some values of a and b to get an interesting picture.