1. **6 points** The curve with equation $y^2 = 17x^4 - x^2$ is called a *kampyle of Eudoxus*. Find an equation of the tangent line to this curve at the point $(1, 4)$.

**Solution:**

\[
y^2 = 17x^4 - x^2 \quad \Rightarrow \quad y' = \frac{34x^3 - x}{y} \quad \Rightarrow \quad y'|_{(1, 4)} = \frac{33}{4}
\]

So the equation is:

\[
y - 4 = \frac{33}{4} (x - 1)
\]

Here’s a graph of both this *kampyle of Eudoxus* and the line tangent to this curve at $(1, 4)$. It is not, however, drawn to scale.

![Graph of y^2 = 17x^4 - x^2 and tangent line at (1, 4)](image)

Figure 1: Partial graph of $y^2 = 17x^4 - x^2$ and the tangent line at $(1, 4)$. 

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2. 5 points If \( f(x) = \sin \left[ x^2 e^{x^2} \right] \), find \( f'(x) \).

Solution:

\[
f'(x) = \cos \left[ x^2 e^{x^2} \right] \cdot \left( 2x e^{x^2} + x^2 e^{x^2} \cdot 2x \right)\]