Exercises

1. Suppose the curve $y = x^4 + ax^3 + bx^2 + cx + d$ has a tangent line when $x = 0$ with equation $y = 2x + 1$, and a tangent line when $x = 1$ with equation $y = 2 - 3x$.
   Find the values of a, b, c, and d.

2. If $f(2) = 10$ and $f'(x) = x^2 f(x)$ for all x, find $f''(2)$.

3. $\lim\limits_{x \to 0} \dfrac{\sin(3x)\sin(5x)}{x^2} = ?$