

Problem statement Suppose $f(x) = \frac{5x^2 - 10x}{e^x}$.

a) Graph $y = f(x)$ in the window $0 \leq x \leq 5$ and $-3 \leq y \leq 1$. Locate the apparent highest and lowest points on the curve.

b) Calculate $f'(x)$ and use it to locate (algebraically) all those values of x at which the graph has a horizontal tangent line. Check your answer against a).

c) Use $f'(x)$ to find an equation for the line that is tangent to the curve $y = f(x)$ at $x = 1$. Draw the line on the graph in a) to check the result.

d) Use the graph in a) to guess the values of x where $f'(x)$ is largest and where $f'(x)$ is smallest. Then graph the equation $y = f'(x)$ on your calculator to check your guesses.