Math 30 – Workshop #11

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1. Consider the function $f(x) = (1 + e^x)(x - 1)$. We will compute the derivative of this function in two different ways.

   (a) Use the product rule to compute $f'(x)$.

   (b) Multiply the binomials in $f(x)$ first, then compute $f'(x)$.

   (c) Which method did you prefer?

2. Find the derivative of each of the following functions.

   (a) $f(x) = (x^2 - 3x)e^x$

   (b) $f(x) = \sqrt[3]{x} \cdot e^x$

   (c) $f(x) = \dfrac{2x}{2 + \sqrt{x}}$

3. At what points on the graph of $f(x) = x^3 + x^2$ is the tangent line parallel to the line $y = 16x - 7$?

4. Where does the normal line to the parabola $y = x - x^2$ at the point $(1, 0)$ intersect the parabola a second time?

5. Find the equations of all the lines through the point $(3, 1)$ that are tangent to the graph of $y = \dfrac{x}{x + 1}$.