Practice Quiz

1. Evaluate
$$\lim_{x \to 0} \frac{(1 - \cos x)(1 + \cos x)}{x}$$
   if it exists. If it does not, explain why.

2. Find all values a for which the tangent line to the curve $y = x(x + 1)^2$ at $x = a$ is horizontal.

3. Let $f(x) = \sin(x)/x$ when $x \neq 0$, and $f(0) = 1$. Is f differentiable at $x = 0$?

4. Does $(pq)' = p'q'$ for any polynomials $p(x), q(x)$? If so, give a pair of polynomials $(a(x), b(x))$ for which $(ab)' = a'b'$.

5. A polynomial $p(x)$, as well as its derivative $p'(x)$ and second derivative $p''(x)$ are plotted below. Match p, p', p'' with A, B, C.