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MT1800 – More practice on derivatives

1. For the following functions find $f'(x)$. No need to simplify.
 - a) $f(x) = \cos^3(x) + 3$
 - b) $f(x) = \sin(x^3)$
 - c) $f(x) = x^4 \cos(x)$
 - d) $f(x) = \frac{x}{4 - x^2}$
 - e) $f(x) = \tan(x)$
 - f) $f(x) = xe^x$
 - g) $f(x) = \ln\left[\frac{x}{4 - x^2}\right]$
 - h) $f(x) = \frac{x^3 + \sqrt{x}}{\sqrt{x}}$

2. A coin is dropped from the top of a building 1200 feet tall. If the position function for the coin is given by $s(t) = -16t^2 + 1200$, determine the velocity of the coin at impact.

3. Find the equation of the tangent line to the graph of $f(x) = \sqrt{x+1}$ that passes through the point $(3,2)$ on the graph of the function.

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4. Find the equation of the tangent line to the graph of $f(x) = \sqrt{x+1}$ that passes through the point $(-4,0)$, NOT on the graph of the function.

5. Find the points at which the graph of $f(x) = \sin x + x$, $0 \leq x \leq 2\pi$ has a horizontal tangent line.