1. Find an equation of the tangent line to the curve at the given point.

$y = \sqrt{1 + x^3}, \quad (2, 3)$

2. If $F(x) = f(g(x))$, and if $f(-2) = 8$, $f'(-2) = 4$, $f'(5) = 3$, $g(5) = -2$, and $g'(5) = 6$, find $F'(5)$.

3. Find the 49th derivative of $f(x) = x\, e^{-x}$.

4. Find the derivative of the function. You do not need to simplify your answer.

(a) $y = \left(x + \dfrac{1}{x}\right)^7$

(b) $f(\theta) = \cos(\theta^2)$

(c) $g(t) = 2^{t^3}$

(d) $y = \sqrt{x + \sqrt{x + \sqrt{x}}}$