Chain Rule

1. Find the derivative of the following functions.

(a) $f(x) = (x^4 + 5x^2 - 7)^9$

(b) $g(x) = cos(a^8 + x^8)$

2. Find the derivative of the following functions.

(a) $h(x) = 9xe^{-kx}$

(b) $y = \left(\frac{x^2+1}{x^2-1}\right)^5$

3. Find the derivative of the following functions.

(a) $y = \sqrt{1 + 6e^{3x}}$

(b) $y = 4^{2-x^2}$

4. Find the derivative of the following function.

$y = \frac{r}{\sqrt{r^2+3}}$

5. Find y' and y'' given the following function.

$y = sin(x^2)$

6. Find the equation of the tangent line to the given curve at the specified point.

$y = (1 + 3x)^{11}$**, at** $(0, 1)$

7. Find the equation of the tangent line to the given curve at the specified point.

$y = sin(sin(x))$**, at** $(\pi, 0)$

8. If $F(x) = f(g(x))$**,** $f(-1) = 4$**,** $f'(-1) = 8$**,** $f'(3) = 1$**,** $g(3) = -1$**,** $g'(3) = 5$**, find** $F'(3)$**.**

9. Find the derivative of the following functions.

(a) $F(x) = \sqrt[5]{1 + 3x + x^3}$

(b) $f(x) = \left(4 + x^4\right)^{4/5}$