

DATE: _____

Chain Rule & Polar Practice

In 1-4, derive each function.

1. $y = 2x \sin(3x)$

2. $y = \tan(\cos x)$

3. $f(x) = \sqrt{3x^2 + 2x + 1}$

4. $g(x) = \left(\frac{1 - \cos x}{\sin x}\right)^3$

5. If $y = 2\cos\left(\frac{x}{2}\right)$, then find $\frac{d^2y}{dx^2}$.

6. Find an equation of the line tangent to the graph of $f(x) = x(1 - 2x)^3$ at the point $(1, -1)$.

7. Find the equation of the tangent line to the graph of $r = 3 - 2 \sin \theta$ at $\theta = \pi$.

8. For $r = 3 - 2 \sin \theta$, find all points (r, θ) where the tangent line is horizontal.