

MTH 251Z Lab

Chain Rule

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Prompts

1. Find the following derivatives.

(a) $\frac{d}{dx}(\sin(2x))$	(f) $\frac{d}{dx}(\sqrt{2x})$	(k) $\frac{d}{dx}((2x+1)^5)$	(p) $\frac{d}{dx}(\frac{1}{2x})$	(u) $\frac{d}{dx}(e^{2x})$
(b) $\frac{d}{dx}(\sin(3x))$	(g) $\frac{d}{dx}(\sqrt{3x})$	(l) $\frac{d}{dx}((3x+1)^5)$	(q) $\frac{d}{dx}(\frac{1}{3x})$	(v) $\frac{d}{dx}(e^{3x})$
(c) $\frac{d}{dx}(\sin(4x))$	(h) $\frac{d}{dx}(\sqrt{4x})$	(m) $\frac{d}{dx}((4x+1)^5)$	(r) $\frac{d}{dx}(\frac{1}{4x})$	(w) $\frac{d}{dx}(e^{4x})$
(d) $\frac{d}{dx}(\sin(5x))$	(i) $\frac{d}{dx}(\sqrt{5x})$	(n) $\frac{d}{dx}((5x+1)^5)$	(s) $\frac{d}{dx}(\frac{1}{5x})$	(x) $\frac{d}{dx}(e^{5x})$
(e) $\frac{d}{dx}(\sin(6x))$	(j) $\frac{d}{dx}(\sqrt{6x})$	(o) $\frac{d}{dx}((6x+1)^5)$	(t) $\frac{d}{dx}(\frac{1}{6x})$	(y) $\frac{d}{dx}(e^{6x})$

2. Find $\frac{d}{dy}((3y^3 - 2y^2 + y)^{2025})$

3. Find $f'(y)$ if $f(y) = \sin^3 y$

4. Find $\frac{d}{dx}\left(\sqrt{\frac{x+1}{x-1}}\right)$

5. Find y' if $y = \sin(\cos t)$

6. Find $\frac{dy}{dx}$ if $y = \sqrt{x + \sqrt{x}}$

7. Find $\frac{dy}{dx}$ if $y = e^{-x^2}$

8. Find the equation of the line tangent to $y = \tan(\sin(x) + 1)$ at the point $(-\frac{\pi}{2}, 0)$.