MATH 181
WORKSHEET 6
APPLYING THE DREIVATIVE OF TRIGONOMETRIC FUNCTIONS USING THE RULES OF DIFFERENTIATION
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Recall

y', $\frac{dy}{dx}$, $f'(x)$, $f^{(1)}(x)$, $y^{(1)}$, etc. are symbols meaning first derivative . . .

y'', $\frac{d^2y}{dx^2}$, $f''(x)$, $f^{(2)}(x)$, $y^{(2)}$, etc. are symbols meaning second derivative . . .

y''', $\frac{d^3y}{dx^3}$, $f'''(x)$, $f^{(3)}(x)$, $y^{(3)}$, etc. are symbols meaning third derivative . . .

y^{IV}, $\frac{d^4y}{dx^4}$, $f^{IV}(x)$, $f^{(4)}(x)$, $y^{(4)}$, etc. are symbols meaning fourth derivative . . .

Reduce numerical results. If an answer *does not exist*, write **DNE** in the corresponding answer blank!

1. Find y' where $y = \sqrt{3\sin(x)}$ $f: D \longrightarrow \mathbb{R}$ where $D = [\,0, \pi\,]$

2. Find $f'(x)$ where $f(x) = \frac{\cos(x^2)}{x}$ $f: (-\infty, 0) \cup (0, \infty) \longrightarrow \mathbb{R}$

3. Find $\frac{dy}{dx}$ where $f(x) = 3\tan(x^2) - 7\tan^2(x)$ $f: D \longrightarrow \mathbb{R}$ where $D = [\,0, \pi/_3]$

4. Let us consider the expression $y = \sec^3(x) \cdot \cos^3(x)$ Find $\frac{dy}{dx}$ and simplify or usefulfy the result.

5. Let us consider the expression $y = \sec^3(x) \cdot \tan^3(x)$ Find $\frac{dy}{dx}$ and simplify or usefulfy the result.

6. Let $y = \tan(x)$ Find y', y'', y''', and y^{IV}

7. Let $y = \sec(x)$ Find y', y'', and y'''

8. Let $y = \sin(x)$ Find $y^{(2)}$, $y^{(4)}$ and y^4

9. Let $y = \sin(x)$ Find $y^{(2117)}$