DERIVATIVE RULES

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Name: _____

Use **only the following rules** to compute the derivative of the given function.

Theorem. *Let c and n be constants. If f and g are differentiable functions, then*

Derivative of a Constant Function: $\frac{\mathrm{d}}{\mathrm{d}x}(c) = 0$

Power Rule: $\frac{\mathrm{d}}{\mathrm{d}x}(x^n) = nx^{n-1}$

Constant Multiple Rule: $\frac{\mathrm{d}}{\mathrm{d}x}\big(cf(x)\big) = cf'(x)$

Sum Rule: $\frac{\mathrm{d}}{\mathrm{d}x}\big(f(x) + g(x)\big) = f'(x) + g'(x)$

Difference Rule: $\frac{\mathrm{d}}{\mathrm{d}x}\big(f(x) - g(x)\big) = f'(x) - g'(x)$

1. $f(x) = \pi^{400}$

2. $f(x) = 10x^4 + 3x^2 - 7x + 500\pi$

3. $f(x) = 6\sqrt[3]{x^2} + 2\sqrt{x^3}$

4. $f(x) = (x+2)^2$

5. $f(x) = (3x - 1)(x + 2)$

6. $f(x) = \dfrac{1}{x^{12}} + 7x - 21$

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

7. $f(x) = 2x^3 - x^2 + 2$, $(1, 3)$.

8. $f(x) = \sqrt{x}$, $(1, 1)$.

9. $f(x) = x^2$, $(1, 1)$